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## ***The Marine Review***

A Monthly Publication Devoted to Ship Building, Marine Engineering and  
the Business of Transportation by Water.

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### IN THIS ISSUE

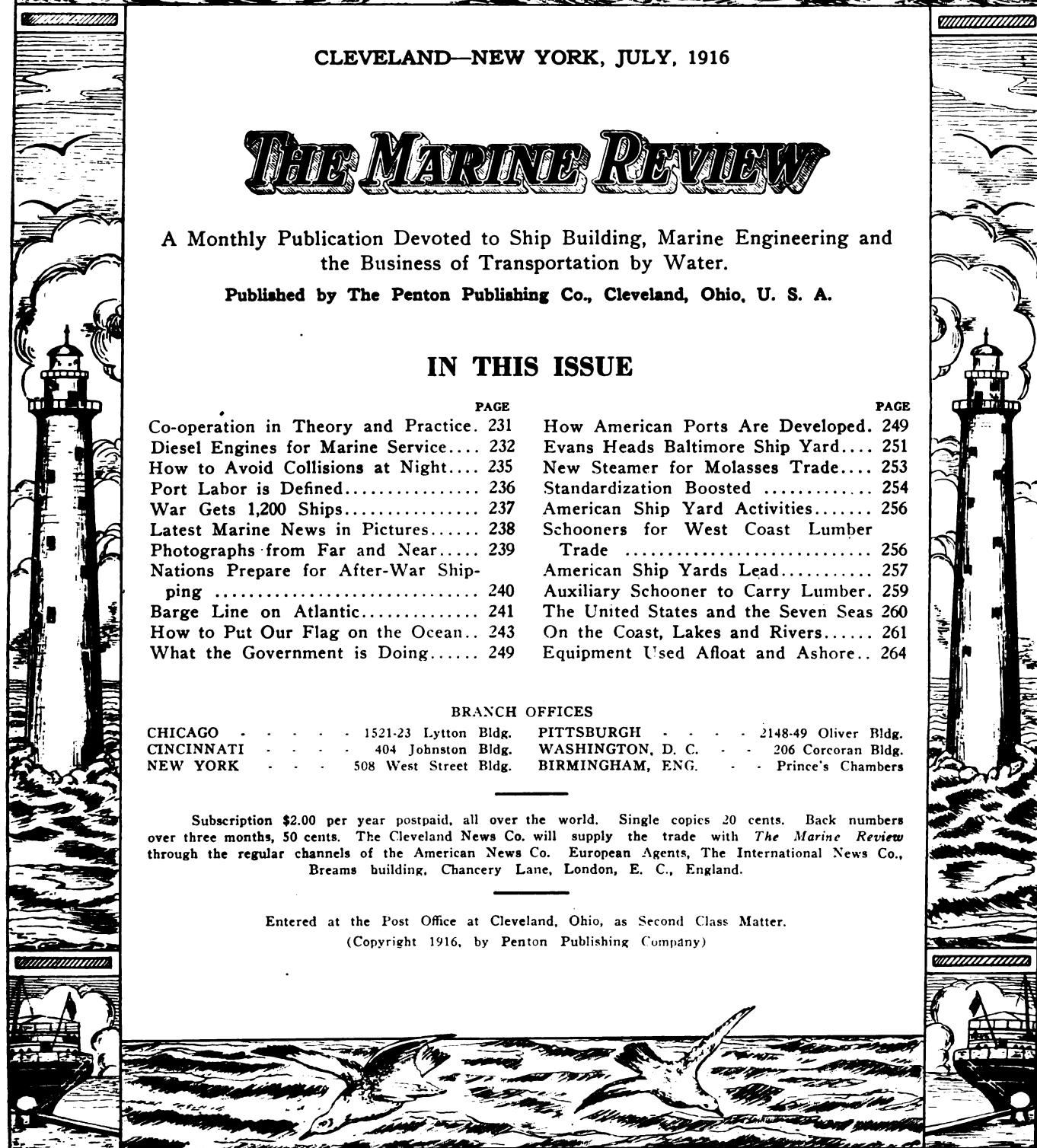
	PAGE		PAGE
Co-operation in Theory and Practice.	231	How American Ports Are Developed.	249
Diesel Engines for Marine Service....	232	Evans Heads Baltimore Ship Yard....	251
How to Avoid Collisions at Night....	235	New Steamer for Molasses Trade....	253
Port Labor is Defined.....	236	Standardization Boosted .....	254
War Gets 1,200 Ships.....	237	American Ship Yard Activities.....	256
Latest Marine News in Pictures.....	238	Schooners for West Coast Lumber	
Photographs from Far and Near....	239	Trade .....	256
Nations Prepare for After-War Ship-		American Ship Yards Lead.....	257
ping .....	240	Auxiliary Schooner to Carry Lumber.	259
Barge Line on Atlantic.....	241	The United States and the Seven Seas	260
How to Put Our Flag on the Ocean..	243	On the Coast, Lakes and Rivers.....	261
What the Government is Doing.....	249	Equipment Used Afloat and Ashore..	264

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JULY, 1916

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No. 7

# Co-operation in Theory and Practice

**Acid Test Shows Up Attitude of Government Toward Shipping—Spirit of Helpfulness is Conspicuous by Its Absence**

IN A SPEECH before the American Iron and Steel Institute, May 26, Edward N. Hurley, member of the federal trade commission, and spokesman for the national administration, emphasized the necessity for co-operation between the government and business. Touching directly on this point he said, in part: "Has our government done its duty? Has it assisted and encouraged business in a consistent and constructive way? When compared with the attitude of European governments and, of late, of the Japanese government, the attitude of our American government toward industries presents a striking contrast".

## *Leavening the Political Dough Heap*

We agree with the eminent commissioner. The contrast is indeed striking. Furthermore, the existing attitude of many men holding high positions in the government service toward industrial endeavor is a disgrace to the community. The stand taken by Mr. Hurley on this subject is exceedingly refreshing. May his influence constantly wax stronger! But in the meantime, while the leaven of good sense is slowly permeating the soggy political dough-heap in Washington, business enterprise is on the rack and the shipping interests seem to have been singled out as special objects of attack.

## *How It Works*

Right now, while Mr. Hurley is spreading the gospel of co-operation, we have pending in congress a bill, passed by a partisan majority in the house, which is destined to place further shackles on the growth of the American merchant marine. This bill, designed to create a toy fleet of fifty ships, is supported by the same party that is pleading for the enactment of a law to abolish efficiency in government shops. What confidence can be placed in an administration that advocates governmental encroachment on legitimate fields of

private endeavor with one hand and encourages public waste, inefficiency and extravagance with the other?

At the same time, on the Great Lakes, we have further evidence of the results that flow from the government's hostile attitude toward business. The seamen's law, sponsored by that intrepid old sea-dog, Robert M. LaFollette, provides that 40 per cent of the deck crew of Great Lakes and ocean-going steamships flying the American flag shall be certified. This means that men who have been entirely satisfactory to their employers and everyone else up to this year are no longer acceptable until they have been subjected to a departmental "acid test".

Recently the steamer F. L. ROBBINS, owned by the Valley Steamship Co., Cleveland, W. H. Becker, manager, was fined \$1,000 for running from Marquette to Cleveland, via Ashtabula, with one less than the specified number of certificated, "acid tested" seamen. The shortage arose from the fact that a man deserted at Marquette, where owing to local conditions, it was physically impossible to ship another. Every effort was made to get a full crew and the steamer was held for three hours, while the woods were scoured for an able seaman.

Here is concrete evidence of how this much-touted governmental co-operation really works. With the bureaucrat in command, business enterprise seeks the cyclone cellar. Through the inflexible application of a ridiculous enactment, vessels are subjected to losses and delays and their owners to the pesterings and pettifoggings of petty officials.

## *Wake Up America!*

What is needed in this country is a thorough awakening in all government circles. The leavening ideas of such men as Hurley must work their way to the outermost fiber of our national administrative organization. Co-operation in high places alone will not suffice. There must be common purpose and unity of effort all along the line.



# Diesel Engines for Marine Service

A Practical Discussion of the Various Factors Which Have Promoted and Retarded the Application of the Diesel Engine to Marine Propulsion

By G. C. Davidson

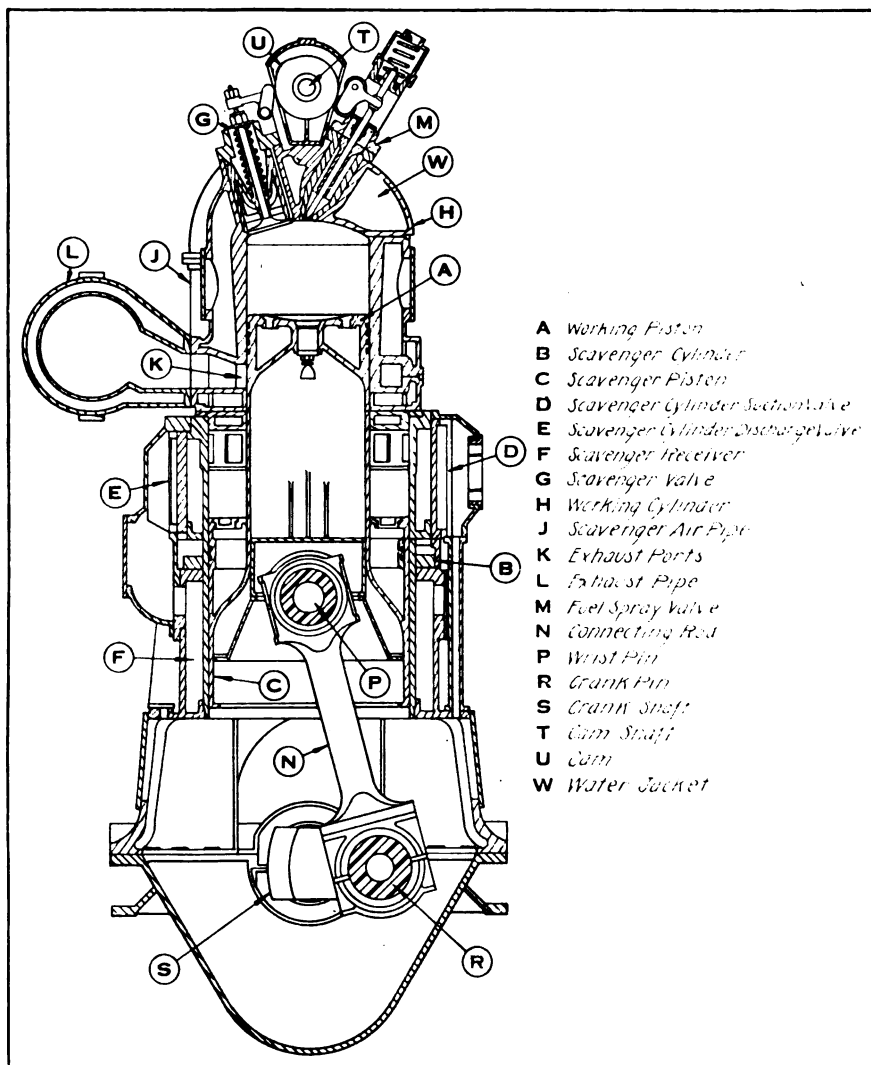
THE diesel engine is now so well known that a description at this time would seem superfluous. Therefore, this paper will be limited to the application of the diesel engine to marine propulsion. It was originally developed for stationary purposes. Such great success was met that licenses were sold by the original developers, the Augsburg Co., of Germany, to a number of other firms in foreign countries. Among these may be mentioned the American Diesel Engine Co., the Nobel Co., Petrograd, and the Burmeister & Wain Co., Copenhagen. The American company limited itself to building stationary engines. The Nobel company was the pioneer in applying these engines to marine purposes. Long before oil engines were used on ships in other countries, the Nobels had a fleet of diesel-engined ships in operation in Russia. The Burmeister & Wain Co. has been very successful in applying its heavy four-cycle, single-acting engines to merchant vessels, as will be shown later. From the above brief sketch, there can be traced a direct line of descent of present-day marine diesel engines from the original four-cycle, single-acting stationary engine. A special application of the diesel engine to marine purposes is to be found in submarines. These vessels were at first fitted with gasoline engines. In certain instances steam has been used. Firms

Presented at the 1915 meeting of the International Engineering Congress.

in several countries almost simultaneously took up the development of the diesel engine for propelling submarines. In the United States, the Electric Boat Co. was the first to build marine diesel engines. These were of the four-cycle single-acting type. In England, a very similar type was built for submarines, by Vickers, Ltd. In Germany, the government inaugurated a country-wide competition. As a result of this the Nuremberg branch of the Maschinenfabrik Augsburg-Nuremberg, A. G., developed a two-cycle single-acting engine. The Augsburg Co. developed a four-cycle, single-acting engine. The Krupps developed a two-cycle single acting engine. From this development may be traced

the modern two-cycle, single-acting engine, which has been taken up by other builders and applied to large merchant vessels. During the past four years, interest in this engine has spread, so that in practically all the leading countries of the world there are large firms engaged in the development or manufacture of marine diesel engines. While there is now a very great variety, when it comes to details and arrangements, all these engines may be classified as multi-cylinder, single-acting; some operating on the two-stroke and others on the four-stroke cycle. Approximately 300 vessels, of which over half are submarines, are fitted with these engines and are running successfully.

A further development, yet in its infancy, is the double-acting two-cycle engine. Prior to the present European war, the Nuremberg company had been working for over four years on a six-cylinder double-acting two-cycle engine of 12,000 horsepower. This engine was reported to have been completed last summer. The firm of Blohm & Voss, Hamburg, had also built and successfully tested a pair of 1,000-horsepower, two-cycle, double-acting engines for a merchant ship. At the outbreak of the war, these engines were installed in the ship and trials were in progress. There are certain limitations to the size of diesel engines which may be advantageously applied to marine propulsion. The smallest engine which can well be



SECTION OF TWO-CYCLE ENGINE

used is in the neighborhood of 100 horsepower. As compared with gasoline engines, the first cost of a diesel engine of small power is such that if below this limit, the saving in cost of fuel is only sufficient to offset the interest and depreciation. As the size increases, the economy in fuel becomes of greater importance, especially on a vessel engaged in long voyages or running almost continually.

The upper limit of size is, at present, fixed by the designs and materials now in use. Up to the present, the upper limit is approximately 400 horsepower per cylinder in single-acting units; that is to say, this represents about the upper limit of engines which have been built and are in successful operation. From the point of view of the designer, it would seem possible to build successful engines of double this power in single-acting units, and of four times this power in double-acting units. In fact, experiments have been made on double-acting two-cycle engines developing 2,000 horsepower per cylinder. This latter figure represents about the theoretical limit to the designer unless some radical departure is made. Such departures are, however, possible so that the upper limit may broadly be stated as depending upon the amount of money and energy available for development work along these lines, and is entirely a matter of the future.

Marine diesel engines of the present day may be roughly divided into two general classes according to weight per horsepower. The light-weight class is represented by the engines used in submarines. Such engines run at a very high speed. The piston speed varies from 1,000 to 1,200 feet per minute. A 1,000-horsepower, six-cylinder engine will, in some cases, run as high as 450 revolutions per minute, and will weigh approximately 40 pounds per horsepower. A heavy-duty slow-speed engine developing 1,000 horsepower at 100 revolutions per minute, will weigh as much as 300 pounds per horsepower. Intermediate types are, of course, also

built. For instance, the 1,000 horsepower Nuremberg engine on the U. S. S. FULTON, running at 260 revolutions per minute, weighs 100 pounds per horsepower.

#### Diesel Engines for Naval Use

For naval purposes, the following successful applications of diesel engines have already been made. For submarines, about 300 engines had been built previous to the European war. Since the war began, a large number have been built or are being built. From such information as can be obtained, it seems likely that from 200 to 300 engines for this purpose alone are under construction. These engines range in size from 300 horsepower to 1,000 horsepower. Much

while steam turbines could be used for high-speed on wing propellers. At least two engines of approximately 12,000 horsepower have been built in Germany for this purpose. A number of battleships are also fitted with diesel-engine, electric-generator sets. These have proved very successful. The United States navy has not yet made any attempt to benefit by the use of diesel engines as auxiliaries, either for cruising or for lighting sets.

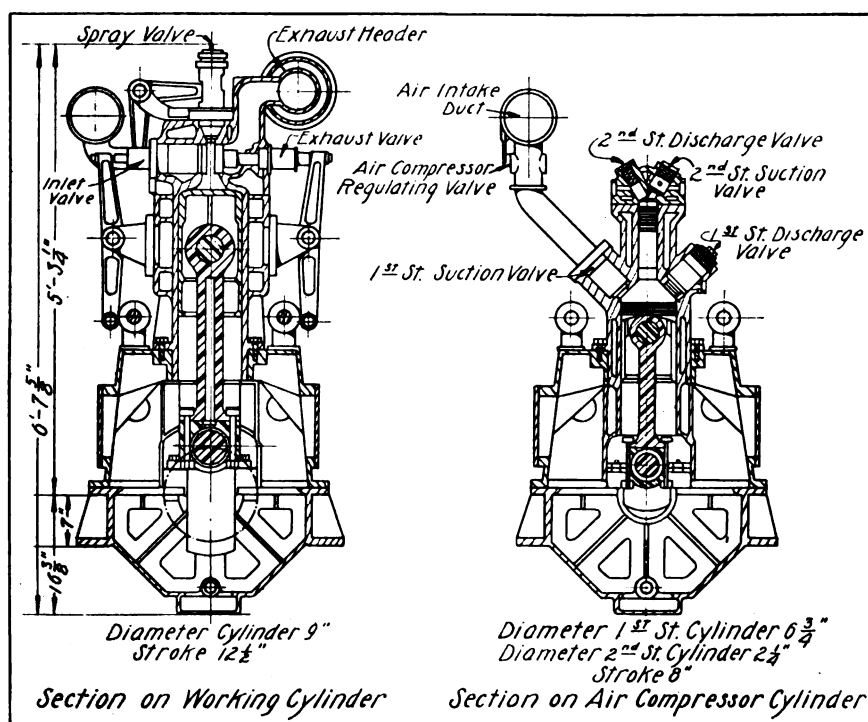
In Russia, certain gunboats propelled by diesel engines have been in successful operation for a number of years. Austria has a cruiser equipped with a pair of 1,000-horsepower Nuremberg diesel engines. Craft of this type, requiring from 500 up to 5,000 horsepower, offer a

large field for diesel engines. While gunboats and cruisers can no longer be considered regular fighting units, they are still very necessary parts of any large navy. Such minor naval craft, if fitted with diesel engines could be made more comfortable, more efficient, and have three or four times the cruising radius they now have using steam. Fleet auxiliaries, such as fuel ships, repair ships, and ammunition ships, could also be driven by diesel engines to advantage. Some of the European countries have already made a start in this direction.

The United States navy is now building the fuel ship MAUMEE, to be equipped with two Nuremberg two-cycle engines, developing about 2,500 horsepower each. These will be about the largest slow-speed heavy-duty engines thus far attempted, and represent a bold step, as the government has had no previous experience in building engines of this type, even in smaller sizes.

The one reason for going ahead with diesel engines for marine purposes is fuel economy. For naval purposes it is not a question of money so much as a question of increased radius, and other military advantages. For this reason, we may look forward to a steady development in this form of motive power in all navies.

For commercial work, the question resolves itself simply into one of



SECTION OF FOUR-CYCLE ENGINE

larger powers have been talked of, but, so far as is known, have not been actually built.

Destroyers require such enormous power (from 10,000 to 15,000 horsepower) that it is not practicable, at present, to install diesel engines to give this output. Certain foreign countries have, however, installed both steam turbines and oil engines in destroyers. For ordinary cruising purposes, the diesel engine is used, thereby effecting economy in fuel and also increasing the cruising radius about 400 per cent above what would be obtained with turbines.

For battleships, the German government intended to adopt the same scheme. By having a ship with triple screws, a diesel engine could be used for cruising on the middle propeller,

dollars and cents. Enough experience has already been obtained to show that, in certain classes of vessels on certain trade routes, the diesel engine does pay; hence the number of ships building at the outbreak of the war.

The advantages, as applied to certain merchant vessels, are, in general: economy in fuel, increased cargo capacity, decreased engineer force, and absence of standby losses.

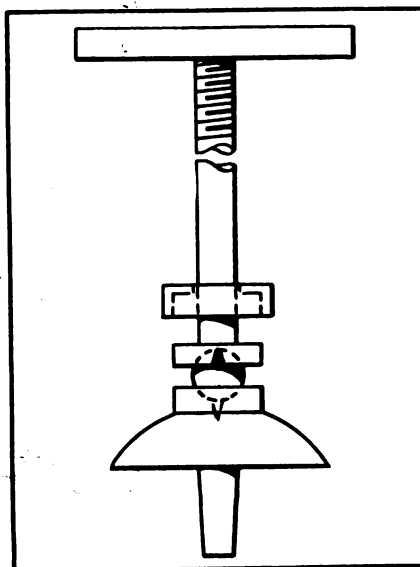
There has always been a difference between the European and American point of view, due to conditions. Previous to the present war, capital was comparatively plentiful in Europe and fuel comparatively scarce. Consequently, the European ship owner considered ultimate saving, and was willing to pay a greater first cost for his propelling plant, if the operating economy would show an ultimate gain. In the United States, the shipping business has never been given much encouragement, and those who have gone into the business have had to consider first cost very seriously. Furthermore, both coal and oil are comparatively cheap in this country. Finally, information in regard to diesel engines has been obtained principally from the technical descriptions of foreign vessels. It is only comparatively recently that diesel-engined ships have visited American ports, so that first-hand information from actual observation has been scarce. A further drawback to American development has been the lack of trained operators. In the course of time, the basic advantages will be realized in the United States and the necessary trained operators will be developed. Under present circumstances, it is impossible to install a diesel engine plant at the same cost as a steam plant. There is a possibility that a diesel engine may eventually be developed which will cost so little more than a steam plant that the difference will not be worth serious consideration.

There are, of course, many cases where a diesel-engine plant would not prove as desirable as a steam plant. These cases depend upon locality and the nature of the service. It is apparent, that in a locality where coal is very cheap and oil expensive, it will be foolish to use oil. A vessel engaged, locally, on short trips could not derive the same advantage as a vessel making long voyages. Anyone who contemplates building a new ship, or repowering an old one, should carefully investigate the matter for himself before deciding on the kind of motive power to be installed.

## Grinding Sea Valves

By E. M. Davis

WHEN a ship is in dry dock, the repair forces are often required to go aboard and grind the sea valves on short notice. Very often it is impossible to obtain advance information regarding the construction of the hub on the discs, and it is necessary, therefore, for the repair foreman to improvise means of turning the discs when grinding. This applies especially to the type of valve that has a tapered hole in the back of the seat, in which a threaded collar or nut is screwed to fasten the disc loosely to the stem. When handling this type of valve, the writer has found it advisable to make the disc fast to the stem, discarding the bonnet, etc. The connection is made by putting a 1/4-inch steel ball between the center holes of the disc and stem, screwing the nut down to make everything tight and in



METHOD OF GRINDING VALVES

line. An ordinary ball, similar to that used in bearings, is satisfactory. This method seems to work out better than using a washer or piece of packing.

## May Ore Shipments

Ore shipments during May on the Great Lakes established a new record for monthly shipments, being 8,449,580 tons as against 8,204,416 tons moved during July, 1913, which was the previous high mark. During May, 1915, 5,012,359 tons were shipped, a decrease of 3,437,221 tons from the shipments of May, 1916. The movement to June 1 of the present year was 10,107,991 tons, an increase of 4,591,799 tons over the corresponding period during 1915, and an increase of 1,957,392 tons over the movement to June 1, 1913, which was the ban-

ner year in the history of the ore trade. The total ore movement for the year 1913 was 49,070,478 tons. If shipments during the balance of the present season equal those of 1913, the total movement for 1916 will be in excess of 51,000,000 tons.

Following are the shipments by ports, with comparative data for 1915:

Port.	May, 1915.	May, 1916.
Escanaba .....	479,259	1,045,186
Marquette .....	178,927	561,555
Ashland .....	513,715	955,041
Superior .....	763,889	1,722,341
Duluth .....	1,974,321	2,671,044
Two Harbors .....	1,102,248	1,494,413
	5,012,359	8,449,580
1916 increase .....		3,437,221

Port.	To June 1, 1915.	To June 1, 1916.
Escanaba .....	528,566	1,443,400
Marquette .....	183,365	614,813
Ashland .....	557,665	1,102,893
Superior .....	851,064	1,933,681
Duluth .....	2,149,310	3,209,325
Two Harbors .....	1,246,222	1,803,879
	5,516,192	10,107,991
1916 increase .....		4,591,799

## Lake Erie Ore Receipts

Out of a total of 8,449,580 gross tons of iron ore shipped during May, 6,365,341 tons were received at Lake Erie ports, distributed as follows:

Port.	Gross tons.
Port Colborne .....	9,858
Buffalo .....	921,553
Erie .....	112,989
Conneaut .....	1,198,287
Ashtabula .....	1,386,707
Fairport .....	350,719
Cleveland .....	1,338,958
Lorain .....	588,293
Huron .....	142,536
Toledo .....	263,457
Detroit .....	51,984
Total .....	6,365,341

## To Arouse Interest

It has been announced that the students in 21 colleges and universities are now competing for the foreign trade council prizes for essays on the American merchant marine. When the council, which is composed of 50 manufacturers, merchants, farmers, railroad and steamship men and bankers, representing all parts of the country and engaged in the economic investigation of foreign trade problems, last year turned its attention to a greater American merchant fleet in the foreign trade it found progress difficult because of "the general lack of knowledge of the fundamentals of ocean transportation".

This inspired a member of the council to offer \$1,500 to be distributed in prizes, mostly to institutions in the interior, to promote careful study of the shipping question. In order that faculty as well as student interest might be stimulated, the contest in each institution, or group of institutions, was arranged under the direction of a faculty committee.

# How to Avoid Collisions at Night

Practical Suggestions on How to Keep Out of Trouble—Definite Knowledge is Necessary and a Study of Diagrams Essential

By Capt. George S. Laing

THE prevention of collision has always been one of the chief duties of mates and masters of all classes of craft. To read the statute rules and commit them to memory is commendable, but nothing short of diagram drill will emblazon ship maneuvering on a man's mind. From right ahead to six points on either bow could be called the danger zone. All vessels meeting opposition colored lights within these limits must either "stand on" or "keep clear". Aft six points on the bow

is far better than swinging to starboard and perhaps leaving one of your anchors on the other ship's fo'c'sle head. If you have no room to go around the long way, have your right hand screw going astern when you are swinging to starboard.

Again, when flanked with a faster steamer on your starboard side who has just a point or so of crossing in her course, don't haul toward her rather ease your ship for a minute or two, or run parallel until her stern is to you, then haul back. Of course,

ing of the stranger close in or come nearer your vessel's head, keep a sharp lookout. She will cross ahead clear, provided her speed is not reduced.

Steamers must not take for granted that they can cross all sailing ships' bows. Some of our schooners have long bowsprits and are ploughing at a 10 to 12-mile an hour clip. Canvas is not always second to bunker coal. While sailing ships are not in the majority nowadays, the rules concerning their procedure to avoid collision must be mastered. In ship maneuvers

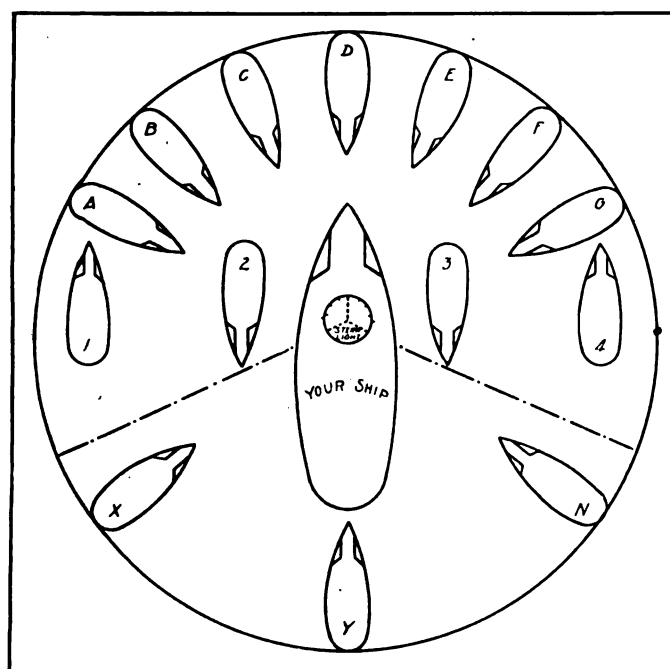


FIG. 1—DIAGRAM SHOWING VARIOUS POSITIONS OF VESSELS WHEN MEETING

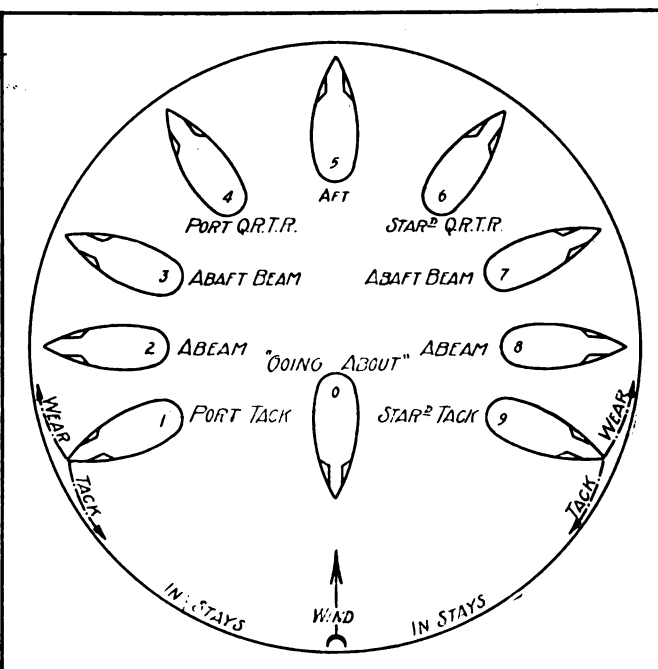


FIG. 2—DIAGRAM SHOWING RELATIVE POSITIONS OF SAILING VESSEL AND WIND

the possible lines of collision become much safer, and where danger does come in this position, very small helm and swing adjust matters at once.

Before describing the use of the diagrams presented herewith, a few practical suggestions may be of service. Steamship collisions would drop 50 per cent if the officers in charge would use the engines in conjunction with the helm *before* she strikes.

When confronted with an awkward predicament, such as another steamer showing red on your starboard bow close to, as often happens in misty weather, why not go around the long way? Altering the ship's head to port 28 points and avoiding collision

when it is possible to do so, there is nothing so accurate as the bearing procedure in determining whether or not an approaching vessel is going to hit you or clear you. The writer has every confidence in this method, which is as follows:

Take the compass bearing of the light in question, which of course is on the bow, and should the bearing remain stationary, you are bound to meet, but if the bearing alters toward your stern, then you cannot hurt each other. In these days of good lights, which are often seen at twice their necessary range, this method saves a large amount of worry, as a couple of minutes often decides what must be done. Should the bear-

the officer on each craft should be able to analyze the other's possibilities. Let me put before you a few general aids that help to solve the sailing ship problems.

1.—If you are closehailed, the "other tack" ship, if within your collision zone, must bear down on you from the lee bow, where of course she would show you an opposition light.

2.—When closehailed, opposition lights to windward must be free ships.

3.—With wind on the quarter, an opposition light to leeward is closehailed on the same tack as you have the wind. And an opposition light to windward is either dead before it or has wind on the opposite quarter.



4.—With opposition lights abaft six points from right ahead, the vessels carrying them are either going with you, or should they be crossing, their other colored light will soon peep out and make the position safe.

5.—Both for steam and sail, opposition lights abaft six points are safe unless carried by much faster craft.

6.—For sail, the starboard tack ship is in the safest position as far as the rules of the road are concerned, and where beating up a coast will admit of long tacks, an old but good dodge is to sail port tack in daylight and starboard tack at night.

7.—Cast iron rules are an impossibility in writing on this important subject as each vessel has characteristics of her own and weather, speed, and sea room are to a certain extent the framers of seamanlike practice.

Two diagrams are presented herewith to make it easy for mates, masters and nautical students to grasp the possible and probable courses of vessels within the collision zone. Men in sail especially should have at their finger tips, according to the direction of the wind, what they may expect in sighting opposition lights both to leeward and windward. Steamboat men should be experts at the whole business, and able to size up everything from a house-boat to a vessel laying an Atlantic cable.

Referring to Fig. 1, always assume that you are in the large vessel labeled "your ship". First of all get a red and green pencil, or crayons, and color in the side lights, and then examine yourself as follows:

#### Explanation of Diagrams

In steamers, which means any craft propelled by machinery, you will note *X*, *Y* and *Z* are in the overtaking angle. Nos. 2 and 3 are passing red to red and green to green. Nos. 1 and 4 are going the same way as yourself, or nearly so. For *A*, *B* and *C* you would stand on, for *D* you would alter your course to starboard. Nos. *E* and *F*, you would most likely swing to starboard for, while *G*, unless very speedy and close to, could either be crossed or hauled more abeam for a minute or two.

Now consider that the large model is still a steamer and the surrounding craft are all sail. Say the wind is dead ahead, then *D* has wind dead aft, and will be making good speed under flowing sheets. *A*, *B* and *C* are free to port while *E*, *F* and *G* are free to starboard. Closehauled craft would almost lay across your hawse.

Now take the whole of Fig. 1 into sailing craft. Assume that the

large model is closehauled to port, what do we find then? Lay a pencil on the diagram for a dog-vein to represent the direction of the wind. *A* is before the wind, *B*, *C* and *D* are all free to starboard. *E* has a beam wind and *F* is closehauled to starboard. On the other tack, the situation, of course is the reverse. Nos. 2 and 3 are passing ships and Nos. 1 and 4 are lee or weather vessels.

Consider the large model running free to starboard. In such a case Nos. 2, 3 and *D* could be closehauled to port, *D* being still in the collision zone. *E*, *F* and *G* are free to port. *A*, *B* and *C* are in stays. No. 1 is the lee vessel; No. 4 is a weather vessel.

More detail is unnecessary, every predicament can be worked out.

Where you think you are without a model to suit your position, put one in.

With port quarter winds, remember that green to windward can be a "dead aft" ship as well as free to starboard. Thrash every case out by itself. The study is more interesting and useful than many are aware of.

Fig. 2 shows the relative positions of sailing craft with reference to the different winds, and aids considerably in rule of the road maneuvers.

To study every conceivable position of vessels meeting in the collision zone, make a drawing similar to Fig. 1, but have it in cardboard with the small models on swivels. Application along these lines will safeguard your position and license to say nothing about life and property.

## Port Labor is Defined

### Redfield Interprets Sections of Seamen's Law Referring to Hours of Labor in Port

SOME interesting correspondence recently passed between A. F. Harvey, vice president, Pittsburgh Steamship Co., Cleveland, and William C. Redfield, secretary of commerce, regarding the provisions in the seamen's law limiting the hours of labor in port. Mr. Harvey's letter to Secretary Redfield in part follows:

"In order to avoid confusion in the interpretation of section 2 of the seamen's act we respectfully request a ruling from your department on the following questions:

"1.—One of the sentences of section 2 reads as follows: And at all times while such vessel is in a safe harbor, nine hours, inclusive of the anchor watch, shall constitute a day's work. As you know, Duluth and Superior have harbors large in area, so that vessels going to the ore and coal docks are navigating for a long period after they enter the piers. Our interpretation of the words "safe harbor" in connection with section 2 of the seamen's act is that after the vessel has ceased navigating, either by making fast to the dock or dropping her anchor in the harbor, she is in a safe harbor. Of course up to the time she has ceased navigating the entire crew on watch are engaged in the work of maneuvering and navigating the vessel.

"Will you please advise, therefore, whether or not we are correct in interpreting the words "safe harbor" in the sentence above referred to, and in the preceding sentence of the same section of the seamen's act to mean when such vessel has ceased navigating in the harbor, either by anchoring

or by making fast to her dock at destination.

"2.—The second question is related to the first, and is, When does the nine-hour day referred to in the sentences of section 2 of the seamen's act, mentioned above, begin? For instance, a vessel arrives at her Duluth dock at noon, at which time change of watch takes place. It is then necessary for both watches to work for a certain period of time removing hatches and getting the vessel ready to receive her cargo. Under these circumstances, does the day in port for the crew begin at the time she arrives at the dock, or anchors in the harbor? If the day in port does begin when the vessel makes fast, or drops her anchor in the harbor, then we take it that the day in safe harbor ceases when the vessel lets go her lines to begin her return voyage.

"3.—Does your department consider that a vessel while navigating through the Soo, is in a safe harbor, within the meaning of section 2 of the seamen's act?"

Secretary Redfield's reply to Mr. Harvey's request for a ruling follows:

"The provision referred to is clearly intended to apply to and cover work necessary to be done on a vessel while in port, as distinguished from duties necessary in actual navigation while on her voyage. Putting it in another way, the provision was not intended to apply until the destination is reached and the voyage is at an end. Applying this construction of the provision to the question submitted by you, it is evident that until a vessel has come to anchor or has been made fast to a dock or pier

within such safe harbor, she must still be considered as on her voyage and being navigated. The nine hours referred to in the provision do not begin to run until the vessel has so come to anchor or has been made fast to a dock or pier within such safe harbor.

"The department does not consider that a vessel navigating through the Soo canal is in a safe harbor within the meaning of the said provision. The passing through the canal can only be considered as a necessary incident to, or a part of, the continuous voyage of the vessel".

## Soo Canal Commerce

The commerce of Lake Superior during May, as measured by the canals at Sault Ste. Marie, aggregated 12,293,476 tons. This is the heaviest traffic for one month on record, and shows an increase of 4,944,909 tons over the movement of May, 1915, the gain being principally in grain, iron ore, wheat and bituminous coal. Compared with 1915, the figures for May show an increase of 10,340,043 bushels in the movement of grain, 3,237,767 tons in the movement of ore, 24,065,906 bushels of wheat, and 827,105 net tons of bituminous coal.

Following is the summary of freight passing through the canals up to June 1, 1916, with comparative data for last season:

EAST BOUND			
	To June 1, 1915.	To June 1, 1916.	
Copper, net tons.....	28,118	13,423	
Grain, bushels.....	11,648,126	19,412,738	
Bldg. stone, net tons.....			
Flour, barrels.....	1,474,353	902,190	
Iron ore, net tons.....	5,318,633	9,019,682	
Pig iron, net tons.....		8,292	
Lumber, M. ft. B. M.....	57,266	36,047	
Wheat, bushels.....	29,761,321	58,195,320	
Gen'l merch., net tons.....	53,392	24,337	
Passengers, number.....	904	1,108	
WEST BOUND			
Coal, anthracite, net tons.....	378,221	352,181	
Coal, bituminous, net tons.....	1,397,902	2,581,150	
Flour, barrels.....	100	205	
Grain, bushels.....	31,250	100	
Mixed iron, net tons.....	46,901	36,217	
Iron ore, net tons.....			
Salt, barrels.....	147,301	179,882	
Gen'l merch., net tons.....	172,156	193,013	
Passengers, number.....	620	697	
SUMMARY OF TOTAL MOVEMENT.			
East bound, net tons.....	6,765,615	11,319,403	
West bound, net tons.....	2,017,687	3,189,435	
	8,783,302	14,508,838	
Vessel passages, no.....	2,995	3,913	
Regis. tonnage, net.....	7,280,091	11,518,848	

## May Lake Levels

The United States Lake Survey reports the stages of the Great Lakes for the month of May, 1916, as follows:

Lakes.	Ft. above mean sea level.
Superior.....	603.00
Michigan-Huron.....	580.49
Erie.....	572.87
Ontario.....	247.13

Lake Superior is 0.62 foot higher than last month, 1.39 feet higher than a year ago, 1.14 feet above the average stage of May of the last 10 years, 0.05 foot

below the high stage of May, 1861, and 2.18 feet above the low stage of May, 1911. During the last ten years the May level has averaged 0.3 foot higher than the April level and 0.3 foot lower than the June level.

Lake Michigan-Huron is 0.57 foot higher than last month, 0.87 foot higher than a year ago, 0.08 foot below the average stage of May of the last 10 years, 3.03 feet below the high stage of May, 1886, and 0.93 foot above the low stage of May, 1896. During the last 10 years the May level has averaged 0.3 foot higher than the April level and 0.2 foot lower than the June level.

Lake Erie is 0.45 foot higher than last month, 1.19 feet higher than a year

ago, 0.14 foot above the average stage of May of the last 10 years, 1.55 feet below the high stage of May, 1862, and 1.56 feet above the low stage of May, 1901. During the last 10 years the May level has averaged 0.3 foot higher than the April level and 0.1 foot lower than the June level.

Lake Ontario is 0.73 foot higher than last month, 1.98 feet higher than a year ago, 0.33 foot above the average stage of May of the last 10 years, 1.82 feet below the high stage of May, 1870, and 2.17 feet above the low stage of May, 1872. During the last 10 years the May level has averaged 0.4 foot higher than the April level and 0.1 foot lower than the June level.

# War Gets 1,200 Ships

**A**PPROXIMATELY 57 merchant vessels of all types, having an aggregate gross tonnage of about 116,724, were destroyed during the month of May as a result of the operations on the sea of the belligerent nations. This record represents a great falling off in losses, as compared with April, when about 90 ships of 214,880 gross tons were destroyed. The total losses to merchant shipping, arising from the war, as shown by data compiled by *The Journal of Commerce*, including all ships destroyed to June 1, as reported by cable, has been about 1,276 vessels of more than 2,585,362 gross tons. That the total of tonnage lost is not exaggerated is indicated by the fact that the tonnage of many vessels destroyed is not shown by maritime records, so that the total does not include them.

The month of May was marked by a transfer of the center of submarine activities, and hence of ship losses, from the North Sea and the northern Atlantic to the Baltic and Mediterranean seas. Losses during the early part of the month were frequent in the vicinity of England, but following the American note to Germany, there occurred an almost complete cessation of losses in these waters, which did not, however, continue throughout the month. The losses in the Baltic were principally German ships, which were sunk by British and Russian submarines. In the Mediterranean, Austrian submarines have been unusually active and, as a consequence, the neutrals of southern Europe suffered more heavily than the Scandinavian nations.

The losses to German merchant shipping during May were heavier than for some months past, but the combined Teutonic losses have, so far, been less than those of either Allies or neutrals. Destruction of British shipping has been on the largest scale, while France stands

second in tonnage lost. Germany ranks third and Norway fourth, while none of the other nations has lost as much as 100,000 gross tons. The following tables show the losses to allied, Teutonic and neutral shipping to date:

## ALLIED SHIPPING DESTROYED.

Nation:	Gross tons.
Great Britain.....	1,623,766
France.....	203,417
Italy.....	85,728
Russia.....	42,432
Belgium.....	25,858
Japan.....	16,015
Total.....	1,997,216

## NEUTRAL SHIPPING DESTROYED.

Nation:	Gross tons.
Norway.....	150,624
Holland.....	84,934
Denmark.....	40,653
Sweden.....	43,992
Greece.....	21,756
Spain.....	16,840
United States.....	10,377
Total.....	369,176

## TEUTONIC SHIPPING DESTROYED.

Nation:	Gross tons.
Germany.....	177,615
Turkey.....	18,150
Austria-Hungary.....	17,478
Total.....	213,243

Total losses of each nation to date, compared with the number of ships and amount of tonnage making up the merchant marine of that country, are shown in the following table. Brazil, which has lost only a single ship, is not included:

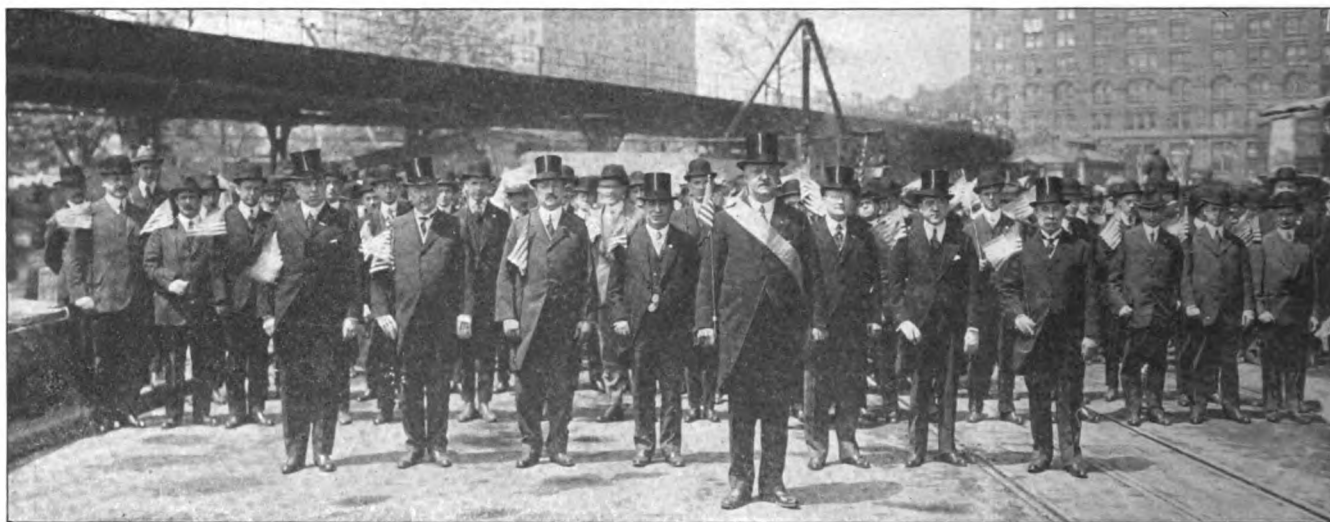
Flag.	No.	Tons.	Steam and sail'g vessels owned according to Lloyd's register book, 1915-1916.	Gross tons of sail and steam vessels destroyed in war, (22 months).
Un. Kingdom.	9,285	19,541,364	743	1,623,766
Brit. colonies.	2,068	1,732,700	1	3,464
*U. S.	2,580	3,522,913	6	10,377
Austro-Hungary	433	1,018,210	8	17,478
Danish.....	835	854,966	39	40,653
Dutch.....	809	1,522,547	39	84,934
French.....	1,539	2,285,728	79	203,417
German.....	2,166	4,706,027	13	177,615
Italian.....	1,177	1,736,545	41	85,728
*Japanese.....	1,155	1,826,029	3	16,015
Norwegian.....	2,174	2,529,188	110	150,624
Russian.....	1,256	1,054,762	37	42,432
Spanish.....	642	899,204	9	16,840
Swedish.....	1,462	1,122,883	43	43,992

\*Excluding vessels trading on the Great Lakes of North America.

\*Japanese sailing vessels are not inserted in Lloyd's Register Year Book, and are therefore not included in these tables.

# Latest Marine News in Pictures

Payment Will Be Made For Acceptable Photographs



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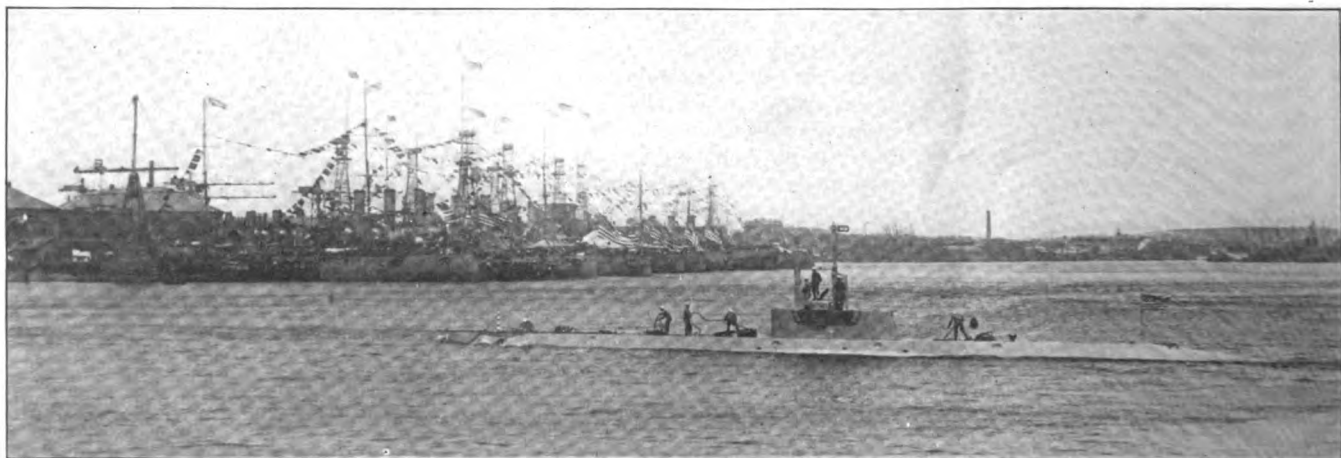
## SHIPPING MEN ARE STRONG FOR PREPAREDNESS

One of the most interesting sections of New York's mammoth preparedness parade was the shipping division organized by the Marine Transportation Association. Over 650 marchers were in line in the division. This illustration shows William Hartfield, Hartfield, Solari & Co., leading the shipping men. Behind him, from left to right, are Leonard Simmons, C. B. Richard & Co.; G. J. Kelly, Holland-American Line; W. M. Lowrie, United Fruit Co.; Max Straus, Russian-American Line; David Lindsay, President Marine Transportation Association; P. McDonnell, Transatlantic Italiana; and R. H. Farley, White Star Line.



## RELICS OF THE PAST

Scene along the old canal connecting Lake Erie and the Ohio river at Toledo and Cincinnati. The canal boat, *CITY OF TOLEDO*, was typical of the barges which were used to ply between points on this once important waterway.



*Copyright by International Film Service.*

## UNCLE SAM PARADES FOR PREPAREDNESS

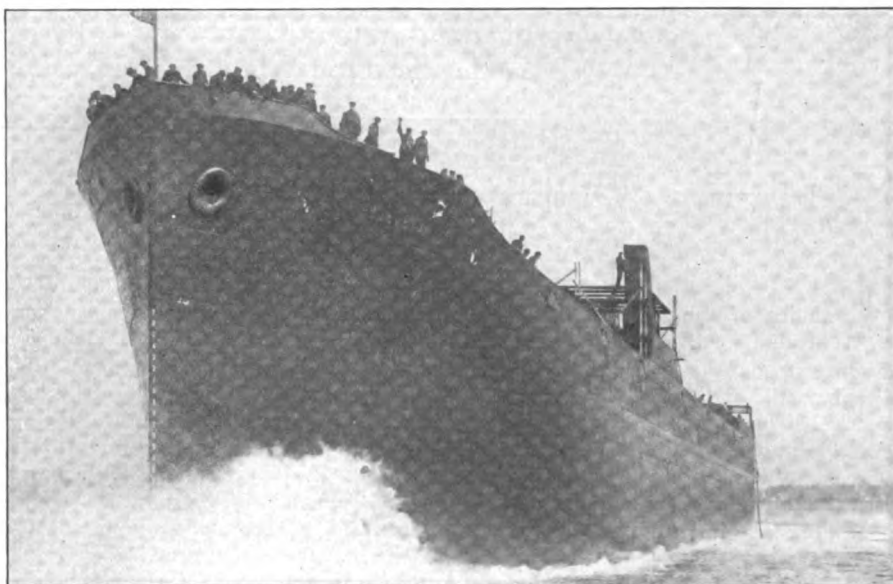
While hundreds of thousands were marching in New York streets in America's greatest parade, United States naval vessels were lined up at the Charleston, Mass., waterfront in an impressive preparedness spectacle. The submarine, shown in the foreground, is preparing to dive.

# Photographs From Far and Near

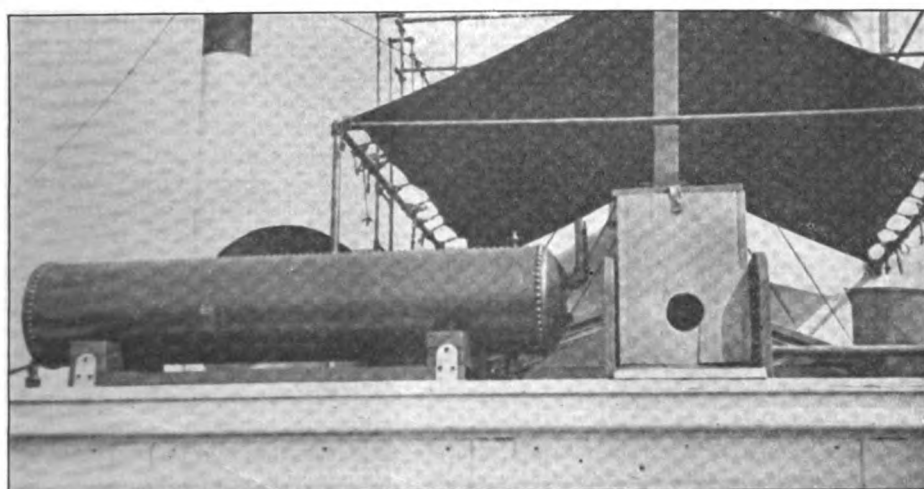
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**SUCROSA'S SPONSOR**  
Miss Dorothy E. Brady, of New York



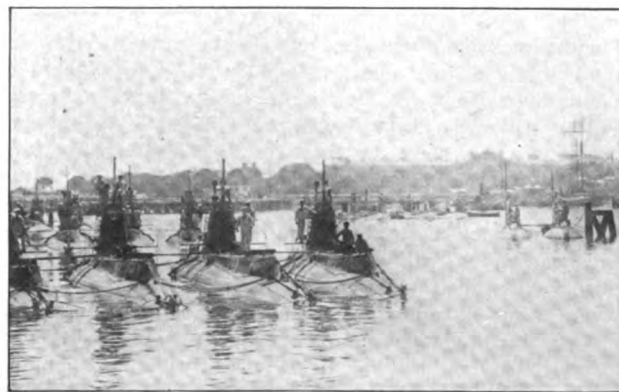
**TANKER FOR CUBA-NEW YORK MOLASSES TRADE**  
The steamship *Sucrosa* was recently launched at the Fore River Ship Yards for the Cuban Distilling Co., New York. The *Sucrosa* is 406 feet long, 54 feet 6 inches wide and 32 feet 6 inches in depth. See article on page 253.



**STORM OIL TANKS**  
Many lake steamers are being fitted with oil tanks. The tank is filled through the upright pipe in the end. A second pipe, equipped with a drip valve leads down and out through the stern of the vessel. A similar tank is carried in the forward end.



**LIFE BOARD**  
Barges of the Pittsburgh Steamship Co. fleet are equipped with life boards—one for each member of the crew. The sailors prefer the life board to buoys or belts.



**A FLEET OF SUBMARINES AT BRITISH NAVAL BASE**  
Undersea operations have played an important part in the world war. The above illustration shows a detachment of U-boats hovering about an English supply station, awaiting orders for action.



# In the Traffic Manager's Office

A Review of the Month on Coasts and Lakes—Useful Pointers  
for the Men Who Get the Business

## Nations Prepare for After-War Shipping

**R**ECENT developments in the affairs of the Cunard Line indicate that British interests are planning a giant ship merger, which will place the nation in a position to effectively meet the competition of neutral shippers after the world war is over. The arrangements which have already been completed practically assure British shipping in every important trade route on the globe.

On Monday, May 29, the announcement was made in London that the Cunard Line, in conjunction with the Ellerman Lines, had purchased the seven steamers belonging to the Watson Steamship Co., Manchester, which maintains a service between Manchester and the Mediterranean. Chief interest in the announcement centered in the fact that the action was taken jointly by the two companies, indicating a stronger relationship between the Ellerman and Cunard companies than had previously been suspected.

### Third Acquisition

This makes the third new connection which the Cunard company has made in the past few months. The first was the arrangement whereby the Cunard Line took over the fleet of the Canadian Northern railway and established a close working agreement with that company. The Cunard interests for many years have had a working arrangement with the Grand Trunk, so that this practically gave them assurance of the most important position in Canadian trade. Then came the announcement of the amalgamation of the Cunard and Commonwealth and Dominion lines, adding to the Cunard interests 24 ships and two new services to New Zealand and Australia. This latest purchase, American shipping men believe, indicates that the Cunard and Ellerman lines will co-operate more closely in the future. Furthermore, a rumor which appeared several years ago concerning an amalgamation of the Cunard and Royal Mail Steam Packet companies has again cropped up, this time with apparently more strength than at any previous time.

The history of the Cunard Line during the last decade has been one of continuous expansion, and the acquisition of the services operated by the Commonwealth & Dominion Line makes its influence practically worldwide. Aside from the South American and Pacific trades, it will have services on all important trade routes, it is said. The company regularly operates services between New York and Liverpool, New York, Falmouth and London, Boston and Liverpool, Boston and London, Montreal and London, and, since the agreement was reached with the Canadian Pacific, between Montreal and Avonmouth. It also has a service from Liverpool to the Mediterranean, while the Anchor Line, which was acquired a few years ago, operates between New York and Glasgow, as well as maintaining services to Africa, the Mediterranean and Australia.

A combination with the Royal Mail Steam Packet Co. would add more than six vessels to the Cunard Line fleet, and would probably involve the control of the Pacific Steam Navigation Co. and Elder, Dempster & Co., besides large interests in its allied companies, the Union Castle Co., Lamport & Holt and the Nelson Line. The Royal Mail fleet includes 53 vessels of more than 1,000 gross tons, and the total tonnage is in excess of 310,000 tons, gross.

### Combination Important

The addition of the services operated by the Royal Mail Steam Packet Co., including regular sailings to South American ports, would materially increase the scope of the Cunard Co.'s influence. The amalgamation, if brought about, would undoubtedly constitute an important feature of the British program to retain control of the seas for her merchant marine after the war. A reason that is advanced as strengthening the probability of the consolidation is that British shipping men have indicated in recent statements the need for closer organization and co-operation in the competition which will follow

the termination of the great war. Germany's great shipping industry, according to reliable reports, is already being prepared for the resumption, immediately following the conclusion of peace, of the campaign for commercial expansion, which was so suddenly halted at the beginning of the war. The preparedness, responsible for Germany's military advances, has been adopted as a trade policy. Just as Germany prepared for war in time of peace, so she is now preparing for peace in time of war. German ship yards are expanding; their output is expected to replace the lost merchant tonnage and, possibly, to make the German mercantile fleet stronger than before the war. News dispatches from Germany, which only recently have offered definite information regarding the situation, and private advices received in American shipping circles, all point to this condition.

### Lose One-Third in War

The German merchant fleet is said to contain 2,166 vessels of 4,706,027 tons, second only to that of Great Britain. *Fairplay*, a leading British authority on shipping, states in a recent issue that 614 German vessels, of about 1,508,733 gross tons, have been captured or sunk during the war, reducing the total tonnage by about one-third. It is said by local shipping men that to replace this amount of shipping in time of war would constitute an extraordinary feat, though interned ships most probably will be restored to their owners.

A factor which, it is said here, may enable German ship yards to continue production of merchant tonnage on a large scale is that the German naval program was practically completed before the war. Germany has, of course, maintained absolute secrecy as to what naval construction has been done during the war, but the opinion is expressed here that aside from work on submarines the German yards have been comparatively free to devote their attention to merchant building, and have accomplished much.

According to the latest information received here from responsible sources, the amount of merchant tonnage which is now building or has been completed since the beginning of the war is something between 700,000 and 800,000 gross tons. The major portion of this has been built for the Hamburg-American and North German Lloyd companies, and includes, besides several large passenger liners, a considerable number of cargo carriers. At the local offices of the lines no information could be obtained as to the exact amount of tonnage which has been added to their fleets, but it was admitted that the new construction had increased the tonnage considerably.

Evidence that the German lines are combining in order to present a better organized front in the competition after the war is contained in recent cables. The various steamship owners have formed a committee to prepare for the resumption of business when hostilities end. Director Heinken, of the North German Lloyd, is president of this committee, which also includes in its membership Herr Ballin, of the Hamburg-American Line. The Reichstag is also reported to be considering the extension of further government aid to ship building and shipping.

#### Revises Mailing List

The Hamburg-American Line has sent out circulars to all firms upon its mailing list before the war. The circular sent requested that the firms addressed indicate in which country they were interested by placing a check opposite its name. The fact that the list includes the names of Russia, Italy, Portugal and Japan of the allied nations is regarded as showing that no trade boycott is anticipated. At the offices of the North German Lloyd it was stated that no such circular had been issued and that none was planned, as it was believed that there would be ample time for this when peace negotiations were under way.

#### Japs Buy American Ships

The fast two-screw steamers KOREA and SIBERIA, built in this country and operated for 15 years under the American flag, have been sold to the Toyo Kisen Kabushiki Kaisha and will be put into service between San Francisco and the Far East. This was their original occupation, but now they will be under Japanese register. The sale was made by the Atlantic Transport Co., of West Virginia, one of the subsidiaries of the International Mercantile Marine Co., and was announced by Philip A. S. Franklin,

vice president, and one of the receivers of the International Mercantile Marine.

Mr. Franklin was asked if the La Follette bill and failure to obtain legislation recommended by American ship owners had prompted the transaction. He replied that the company had received for each of the ships \$2,000,000, or double the purchase price.

"The sale speaks for itself", he added. "The Japanese can operate them cheaper than we can and were willing to pay a high price".

Asked if the war's effect on shipping had not changed opinions on steamship operation as well as notions of values, Mr. Franklin replied that present conditions were temporary, and that after the war the ships

might not be saleable for as high a price or worth so much in earning power. The gist of his comment was that the transaction was purely financial.

As if indicating that the sale of ships was no novelty to the company, despite the unprecedented demand for bottoms, Mr. Franklin then let it be known that the CHINA, one of the other ships purchased from the Pacific Mail, had been sold to a company which he called the China Mail Steamship Co. The CHINA is a steamer of 5,060 tons and was built in 1889. The sale price for this ship was \$275,000, and the sale was made, Mr. Franklin said, last October, or only a few weeks after the International Mercantile Marine had purchased the five ships from the Pacific Mail.

## Barge Line on Coast

THE inability of the railroads to relieve the freight congestion near the Atlantic seaboard has led to the installation of power barge freight service between New York and Philadelphia by way of the Delaware river and the Raritan canal. Four barges, each with a capacity of 125 tons, constitute the original fleet. The first trip was made Monday, May 29. The new inland waterway service is known as the Blue Bee Line and is supported by a number of the largest manufacturing and exporting establishments of Philadelphia and adjacent territory.

The idea of the line originated some months ago with C. E. H. Brelsford, president of the C. E. H. Brelsford Co., who approached the Philadelphia Bourse and the department of wharves, docks and ferries with the project. The Bourse interested large shipping houses of Philadelphia in the proposed line, while the department arranged for the terminal facilities and other details. Mr. Brelsford is general manager and treasurer of the line.

Among the firms which are interested in the new service are the Miller Lock Co., Henry Disston & Sons, Inc., Thomas Devlin Co., Victor Talking Machine Co., C. E. H. Brelsford Co., the Wanamaker stores and other manufacturing establishments and department stores.

The terminals of the Blue Bee Line are Pier No. 5, North Wharves, Philadelphia, and Pier No. 36, East River, New York City. Daily service is maintained, one barge leaving each city at 4 o'clock in the afternoon. Fourteen hours are consumed in the actual trip. To permit quick deliveries, the line maintains at each terminal a teamster service, which makes almost express time and for which an additional charge is imposed.

The Blue Bee Line carries freight between the two cities at the same rates as the railroads and employs the same classification. The service is of particular advantage to Philadelphia exporters in that the barges are used as lighters in New York harbor for loading or receiving freight. This is a great facility because it is now difficult to get prompt lighterage service at New York because of the great congestion. The barge leaving Philadelphia each afternoon stops at Disston's wharf at Tacony, the Devlin wharf at Burlington and at Roebling's, N. J., to take on freight for New York. The line, however, does not deliver freight from Philadelphia to these points.

The barge service was hailed with enthusiasm by many Philadelphia shippers and manufacturers who had been suffering vexatious, costly delays through the freight embargo on the railroads and the general congested conditions. The Blue Bee Line affords a daily regular and certain sailing and considerably reduces the time now required to send freight to New York.

Mr. Brelsford, in addition to being general manager of the line, will act also as the Philadelphia agent. The New York agents of the Blue Bee will be W. & S. Job & Co., 29 Broadway, New York City.

"The Blue Bee Line is to be a permanent service," said Mr. Brelsford recently. "We have in the Delaware and Raritan Canal an excellent means of communication with New York which we are going to utilize to the fullest extent possible."

The company also expects to add to the present fleet and will build its own boats, according to Mr. Brelsford.

## How to Avoid Freight Claims

By N. W. Van Wyck

*Freight Claims Agent, Canada Steamship Lines, Montreal*

ANY transportation company to be successful must give satisfaction to its patrons and one of the most important means of doing so is the prompt payment of its legal losses. To the freight claims department is presented the bills for accidents, errors, and omissions incidental to the handling and transportation of the various commodities intrusted to its care. Its duties are to adjust these losses with the least possible delay and to do all possible to remove the causes from which such claims arise, and by so doing give a strong incentive to the public to patronize the line. The soliciting freight agent finds it hard to secure business if claims are not paid. It therefore remains for the various employes of the freight department to have their records in such shape as to enable them at all times to give a clear and concise report in a proper manner enabling the claims department to make whatever adjustment it finds necessary.

It is practically impossible for any carrier to do business without claims, but a carrier to be successful must reduce its losses to a minimum, and to do so requires the co-operation of its employes which is the greatest asset a company can have. The freight claim department particularly requires the co-operation of the checkers. They must properly tally the packages received, noting that the goods are properly addressed, it being most essential that shipments should be sufficiently marked to permit of prompt identity, which is a point many shippers entirely overlook, and the checker must see to it that such omissions are drawn to the consignors attention. This alone will eliminate a larger proportion of the company's losses.

The billers can relieve the company of unnecessary losses in correctly transcribing the shipping instructions on their manifests. Many times efforts to "short-cut" this operation results in an incorrect and incomplete description of the consignment, a wrong name, address, or failure to show marks usually results in loss of freight and much annoyance to the consignee.

Stevedores in handling the freight must be alive at all times to the careful handling essential to fragile articles, paying particular attention to the coöperation of packages which may be of inferior quality, a torn bag or a broken box, remembering that a stitch in time saves nine.

The delivering of freight is another question which requires particular atten-

tion on behalf of the inwards clerks. Many consignments are made to the order of the shipper, and it involves upon the inwards clerk to secure the original endorsed bill of lading before making delivery. This has been overlooked on some occasions, and the failure of the consignee to pay the draft has resulted in the company having to assume the liability for the value of the consignment, consequently this is one of the most important factors a carrier has to deal with.

It would also not be amiss to say something here in respect to "over" and "short" freight. If the checker has seen to the question of the proper marking of the goods when received, and a package should through some error be put off at a point other than intended, the markings will enable our over-and-short clerk to forward the consignment



N. W. VAN WYCK

as stray freight to its proper destination with the least possible delay. Prompt attention to such matters lessens the possibility of loss.

We should all therefore see that these various items of interest receive the very best attention, thereby serving to promote the good name of the Canada Steamship Lines and furthering its success which incidentally means the success of the individuals connected with it.

The Ocean Steamship Co., Savannah, is distributing an illustrated pamphlet to mark the opening of the new Savannah Terminal. This company was one of the first to ply the Atlantic coast, starting with a fleet of a total gross tonnage of 6,563 in 1872, it has increased the tonnage to over 46,000 at the present time. The

booklet is well illustrated with photographs of the new steamships and pictures and diagrams of the new terminal.

## Line to Spain

ACTION of the Spanish government in subsidizing the proposed steamship line between Vigo and New York, practically assures the success of plans which have been discussed in New York for some time. American capital is expected to form a \$20,000,000 corporation which is to operate a fleet of eight fast passenger and freight steamers.

It is proposed to make the crossing in six days, the steamers connecting with special trains making the trip between Vigo and Madrid in eighteen hours and connecting there with fast expresses for Paris and other points on the continent. A large hotel will be built at Vigo in connection with the new line.

The design is to make the new line the main artery between America and the continent, as the route is about 1,000 miles shorter than those by way of Liverpool or Southampton. Both terminals are neutral, it is also pointed out in this connection, and the line would not be affected by a shortage of tonnage such as that which exists on the English routes because of the war.

The Marquis de Commillas, head of the Spanish Transatlantic Co., stated that negotiations with the Spanish government had not as yet been concluded. The determination of the government to introduce the subvention bill, however, appears to assure the inauguration of the line.

## Moves Steel Tower

IMPORTANT changes in the arrangement of the harbor lights at Sheboygan, Wis., due to breakwater improvements by the United States engineers, have recently been completed by the United States bureau of lighthouses. An interesting feature was the removal of the entire cylindrical steel tower from the old north pier and its replacement on a concrete foundation on the new breakwater. The weight of the tower is approximately 30 tons. The moving of the structure was by means of a scow 35 x 120 feet in dimensions. It was towed to the breakwater by a harbor tugboat and transferred to the new location on timber ways. The time consumed was one day for preliminary work, one day for actually moving the tower, and one day for disposing of the gear and fastening the tower in place.

# How to Put Our Flag on the Ocean

National Foreign Trade Council in Vigorous Report Tells What is  
Needed to Vitalize American Shipping—Practical Suggestions Made

IN THE opinion of the National Foreign Trade Council a truly national shipping policy should permit and encourage the development of a merchant fleet discharging the following functions:

*First*—To increase the national income and domestic prosperity through greater facilities for the sale abroad of products of the soil and industry of the United States, the importation of materials indispensable to life and industry, and through the freights collected from world commerce;

*Second*—To maintain, under the flag, communication with distant possessions;

*Third*—To aid the national defense and maintain commerce during war, whether the United States be belligerent or neutral.

The amount and character of additional tonnage necessary thus to serve American foreign commerce, under our own flag, can best be determined by analysis of that trade and its transportation, under normal conditions, before the European war.

In the fiscal year ended June 30, 1914, a month before hostilities began, foreign vessels carried 80.3 per cent of the total value of our exports and imports; American vessels, 8.3 per cent; cars and other land vehicles, 11.1 per cent.

## Non-Competitive and Competitive Exports

American exports can be divided broadly into two classes. The first consists of agricultural and forest products vitally necessary to the life and industry of other people upon the free movement of which the existence of a large part of the world's population depends. These commodities are normally sold for cash, passing to the ownership of foreign buyers, their agents or to middlemen, before leaving our shores. The maritime nations urgently requiring them, provide the transportation for these commodities which are bulky and cheap, and constitute the greater part of the total value of the export trade.

The second and smaller class of American exports consists of partly finished and fully manufactured goods which are not vital to the buyers and which, therefore, enter into competition with similar manufacturers elsewhere produced. To insure a market for this grade of exports it is necessary that transportation cost shall not exceed that of similar products reaching centers of consumption from competing seats of production. This desirable parity of rates in competition with the rest of

the world did generally obtain before the war, but in many cases, exporters selling c. i. f. (including cost, insurance and freight in the selling price) and seeking further to extend and diversify American trade, were obliged to establish warehouses throughout the world in order to obtain the advantage of more direct, frequent, and often cheaper, transportation to desirable markets. Under normal conditions superior transportation is obtainable at certain European ports because the tonnage of imports into Europe exceeds that of exports, making more cargo space avail-

## Submitted to Congress

*The accompanying report was submitted by the National Foreign Trade Council to the merchant marine committee of the house of representatives. The merchant marine committee of the Trade Council formulated the report after a careful inquiry, and it was approved by the main body before submission to congress. The report was prepared on the original administration shipping bill, which was later considerably modified, as indicated by notations in the published report.*

*This report is designed more as an exposition of the fundamental principles which must animate any effective shipping policy than as an onslaught on the administration's bill. Representing as it does the combined judgment of many of America's leaders in the marine field, it merits the closest attention.*

able for shipments to neutral markets capable of consuming American manufactures. The more numerous and faster lines from Europe to neutral markets are due to:

(a) Greater diversification of European export trade;

(b) Larger number of traffic-producing ports at which vessels may call in early stages of outbound and last stages of homeward voyages;

(c) Profitable passenger traffic (including emigration);

(d) Financial support by governments to insure communication with colonies or distant strategic points.

Such lines give to European trade a great advantage not only in transportation of high-grade freight, usually classified as express traffic, but also in faster and more frequent mails. Low-grade freight is sometimes carried on liners, but the bulk of it the world over is borne in slow cargo carriers, usually

tramp steamships, which do not operate continuously on fixed lines.

Imports into the United States likewise fall into two classes: highly finished manufactures of small bulk but great value, and raw materials and food stuffs of large bulk. The total tonnage of imports is about half that of exports. Competition for cargoes to the United States, therefore, is nearly always brisk and normally keeps freights on imports (which are ultimately borne by the consumer) below those on exports.

## Tramp Steamships Indispensable

The disparity between import and export tonnage vitally affects the character and cost of the transportation afforded the foreign trade of the United States, for it means that not all vessels used in export trade can obtain direct return cargoes, and many therefore must load at foreign ports for destinations other than the United States. For instance, a steamer starting from Savannah across the Atlantic with cotton for Liverpool is likely to be chartered to carry coal from Wales to Argentina to avoid being compelled to return to the United States empty (in ballast). If no cargo offers at Argentine ports she may proceed in ballast to Chile to take nitrate for Europe and thus remain away from the United States indefinitely or until, at some port, a profitable cargo or charter to the United States is offered. To lay down Pittsburgh steel at Vancouver in competition with British steel shipped from England via Magellan, steamers from New York [owned or chartered by the exporters] in addition to taking steel for Vancouver had to take cargo for delivery at intermediate points along the west coast of South America and Mexico. After discharging steel at Vancouver, where no cargo direct for the east coast of the United States is regularly available, these vessels ship lumber or coal for the Gulf of California. They are reloaded with copper matte for Dunkirk, France, and in France take chalk for New York, the whole trip consuming from six to eight months. It was the only process whereby the cheap water rate from Liverpool to Vancouver, made possible by the existence of a large export traffic out of British Columbia to Europe and the Far East, could be overcome. In these voyages the export trade of other countries was served three times, while that of the United States was served



once, but it was the toll taken from the commerce of the others that made this export of American steel possible.

Similar examples from other industries might be cited, but this is sufficient to reveal the extent to which American commerce is necessarily interwoven with that of the rest of the world, and the cheap and bulky character of most American exports demands, normally, the low rates which can be provided only by those vessels — chiefly tramp steamers — which, by taking cargoes for whatever destination is offered, avoid the deadening expense of long return trip in ballast. In the language of a recent report from the United States Consul General at Rio de Janeiro: "A freighter follows whatever route insures its receiving the highest prices; owners and charterers maneuver a cargo vessel all over the map with that sole end in view."

An American merchant marine sufficiently large to relieve, say, 60 per cent of our bulky exports and imports from dependence on foreign shipping must obey this economic necessity as completely as the European and other shipping now carrying the greater part of this trade, for shippers customarily give freight to the lowest bidder, who is, by and large, the agent of the vessel which keeps most constantly employed.

#### America Dependent on Ability to Compete

The traffic to and from the United States, therefore, will go to American vessels only if they are able to compete with foreign vessels on the outer legs of the circuitous voyages they will be obliged to make in serving world commerce generally.

The possession of a greater number of American-flag ships would have rendered our commerce less vulnerable to the reduction of its accustomed transport through destruction, immobilization and impressment of foreign tonnage. The 4,000,000 tons of British shipping, engaged, prior to the war, in commerce between ports wholly foreign to the United Kingdom, shrank, during the first year of the war, to 2,500,000 tons, and has since further decreased. The possession of established American lines to certain markets now reached only via Europe, would have facilitated a wider exportation of competitive manufactures and enabled American exporters more completely to supply markets customarily served by Europe.

The most profitable of all industries in foreign trade, at the present time, is shipping. A larger American merchant marine would have profited through world commerce during this war, precisely as the manufacturing industry now profits from the needs of the belligerents, and shipping earnings would be contributing to a trade balance

larger than that which now stirs the American imagination to the possibilities of trade extension through judicious foreign investment made possible by war profits. At a time when Great Britain's excess of imports over exports surpasses all records, the earnings of British shipping not only offset war indebtedness, but one-half of the profits in excess of normal returns go to the state. This means that not only British importers, but all others who pay the freight on goods carried in British vessels, contribute to the war budget. British shipping, therefore, not only permits the British Empire to conduct "business as usual," but is also a source of governmental revenue.

This desirable situation arises from a shipping which by no means carries all of British commerce. Only about 55 per cent of the tonnage annually entering and clearing from ports of the United Kingdom, in a normal year, is British, the remainder being foreign. During the war the British percentage

#### Kipling on Tramps

*The liner she's a lady by the paint  
upon 'er face,  
An' if she meets an accident they  
count it sore disgrace,  
The man-o-war's 'er husband, and  
'c's always 'andy by,  
But, oh, the little cargo-boats!  
They've got to load or die!*

*The liner she's a lady, and 'er  
route is cut and dried;  
The man-o-war's 'er 'usband, and 'c  
always keeps beside;  
But, oh, the little cargo-boats that  
'aven't any man,  
They've got to do their business first,  
and make the most they can!*

KIPLING.

is somewhat increased. In ordinary times about 60 per cent of the carrying power of British shipping in foreign trade is employed in bringing imports and taking exports from the United Kingdom. This excludes the "home trade" between ports of the United Kingdom and with the European ports between Brest and the Elbe. The remaining 40 per cent being engaged in trade between foreign ports, which proves the extent to which the shipping of a nation with a diversified foreign commerce must also be responsive to the demands of the commerce of the rest of the world. Seventy per cent of British steam shipping consists of tramp vessels.

The almost universal sentiment of the people of the United States for a greater merchant marine proceeds from a somewhat intangible desire that American commerce shall be carried under our flag. It is evident from England's experience that no nation can transport all of its commerce in its own vessels. Assuming that the carri-

age of 60 per cent of American foreign commerce in American vessels would render this country reasonably independent of the merchant marine of any other nation, it is important to determine how great an American tonnage would be necessary. In 1915, 1,871,543 tons of American shipping carried 14.3 per cent of the total foreign commerce. This tonnage, for the most part, was engaged in traffic with nearby markets, the West Indies and Central America, Canada and Europe. With few exceptions only that portion of it which was transferred from foreign flags at the outbreak of the war steamed regularly to more distant parts of the world.

#### Six to Ten Million Tons Needed to Carry 60 Per Cent of U. S. Trade

Assuming that American shipping large enough to carry 60 per cent of our own commerce would find itself drawn into general world trade (as is the British merchant marine), it is estimated that somewhere between 6,000,000 and 10,000,000 gross tons of steamers of various sizes and types would be required, to be obtained by construction and transfer from other flags, the total being reached during the next decade and consisting of passenger and cargo liners, specially constructed vessels (tankers and colliers), and tramp steamships, discharging the functions enumerated at the beginning of this report. Included therein is the vital question of natural defense. Observation of the present British control of the seas and the transportation of allied troops to fighting zones both near and remote from England and France establishes that a merchant shipping adequate to the needs of a diversified commerce automatically provides the types of vessels most needed for the transportation of military and naval supplies and troops in time of war.

The value of this additional tonnage [6,000,000 to 10,000,000 tons] would range somewhere between \$50 a ton deadweight, the price prevailing before the war, and \$100 per ton, the price of construction at the present time, or a total of from \$520,000,000 to \$1,040,000,000, which to earn the 6 per cent average dividend rate, after depreciation, characteristic of British shipping over an extended period of prosperous and depressed years, would have to return to the investors from \$31,200,000 to \$62,400,000 per annum. It should be remembered that while the total tonnage reported by the United States commission of navigation on June 30, 1915, totaled 8,389,429 gross tons, only 1,871,543 tons was registered for foreign trade, the remainder being in the coastwise, lake and river trade.

The foregoing estimate of the tonnage required is liberal, but in size it

would still be little more than half the total of British steam tonnage which, before the war, was about 45 per cent of that of the entire world. At a time when predictions are freely made that the United States will become the world's banker and acquire the greatest share of the world's foreign trade, a shipping, in the foreign trade, of from 6,000,000 to 10,000,000 gross tons would appear not an excessive goal to be attained 10 or 20 years hence. Unless such progress is made the United States will not become one of the foremost maritime nations.

It is obvious that the rise of the United States as a maritime nation must necessarily be accomplished by the transfer of a certain amount of tonnage from foreign to American register. Indications are that after the leading maritime nations have made up the wastage of war the world's tonnage will be adequate for world commerce. For the United States alone, by construction, to add say a million tons a year, for eight years, to the world's shipping, in foreign trade, would cause shipping so far to exceed available commerce as to depress freights to a point where shipping would be unprofitable to all concerned. It would seem more feasible for this country to achieve a greater measure of shipping independence by a combined policy of purchase of foreign-built vessels and new construction in American ship yards, for precisely as the profitable operation of American shipping will be a national asset the development of American ship building for this and other countries will strengthen the country's resources.

#### The Government Shipping Bill

Advocates of the pending bill (H. R. 10,500) claim that it is a necessary first step to encourage the full development of American shipping. It is fair, therefore, to inquire just what the proposed policy will accomplish, and whether it will lead to, or permit, the further steps necessary to produce a really great American merchant fleet.

Briefly stated, the bill as introduced by the Hon. J. W. Alexander, in the house of representatives Jan. 31, 1916, provides for the creation of a shipping board and the raising of \$50,000,000 by issuing United States bonds, this sum to be expended in the construction, purchase or leasing of merchant vessels, which may be sold or chartered to private companies, or operated by the government itself, and which may be taken by the government for the use of the army and navy in time of war. The shipping board is given all the powers over ocean transportation that the interstate commerce commission exercises over rail transportation. No corporation, firm or individual will be per-

mitted to engage in either domestic or foreign shipping in American ports without a license from the shipping board. This means that the owner of every vessel, American or foreign, touching at American ports must obtain a license. No vessel will be permitted clearance unless its owners have such a license. If any vessel fails to comply with all the orders of the board regarding rates and service, rules and regulations, the board is authorized and directed to revoke the license held by the owners and this will, presumably, prevent clearance not only of the offending vessel, but of all vessels belonging to that owner. This revocable

minimum amount necessary to establish the United States in the shipping position above described.

Nothing like 600,000 gross tons is available from the new nations, which, during the war, permit alienation of their merchant vessels. American ship yards will not guarantee deliveries of new construction within two years. Rear Admiral Benson has testified that the utmost government navy yards can guarantee, if assured prompt deliveries of material, is six 10,000-ton ships in two years. The effect of the bill upon the country's aspiration for larger shipping is, therefore, more important than its possibilities of immediate relief of the present restriction of American commerce due to scarcity of vessels and abnormal rates.

#### No Tramp Steamships Provided

This bill appears to restrict the operation of these government vessels (whether operated by the government or by private corporations) to trade directly between the United States and foreign countries, that is, in the language of the act, to "use in the transportation of the commerce of the United States with foreign countries," and between the United States and our distant possessions; in other words, to service on certain fixed lines. It fails, therefore, to touch tramp shipping upon which the greater part of our exports and imports depend. The limitation quoted does not appear in the substitute bill H. R. 15,445.

Either by direct operation or leases of the vessels to private corporations, the bill proposes to embark the United States in an industry normally costing more to conduct under the United States than under foreign flags, and to restrict that operation to what often proves the least remunerative branch of shipping—established lines. Under normal conditions of peace private companies can be induced to operate government ships only if the rate of lease or charter is sufficiently lower than the market or offsets higher American operating costs. Somebody must pay the difference. Under the proposed policy it will be the taxpayer, just as surely and completely as under a subsidiary policy. If, then, government aid is extended only through leasing of government-owned vessels, the American flag in foreign trade will become a government monopoly. Increase of American shipping, so long as operating costs exceed those under foreign flags, will depend upon the willingness of taxpayers to increase appropriations for new construction and continued deficit in the government shipping account.

With the fullest conceivable accomplishment of this law supplying less than

### Report Antedates New Bill

*Since this report was formulated the committee on merchant marine and fisheries of the house of representatives on May 9 reported H. R. 15,455 as a substitute for H. R. 10,500. This limits the proposed regulation of shipping in foreign trade to supervision of conferences and traffic agreements, prohibition of deferred rebates, the use of fighting ships and discrimination between shippers and localities. The provisions of H. R. 10,500 for licensing all vessels clearing from United States ports, preferential railroad rates for merchandise to be exported in American vessels and prohibiting sale of American ships to non-citizens except by authority of the shipping board do not appear in the substitute bill. The authority of the government to operate the vessels obtained under the law is limited to five years from the close of the present war and the character of the trade in which private enterprise may operate the government-owned vessels is not delimited. The substitute provides for a shipping board of seven instead of five members and like H. R. 10,500 authorizes the issuance of \$50,000,000 of United States bonds wherewith to purchase, lease or construct ships. Certain administrative features have been added, and the shipping board empowered to regulate interstate water rates as rail rates are now regulated by the interstate commerce commission.*

license system is the power by which the board proposes to control all vessels, American or foreign, calling at American ports, and by which it is proposed to regulate ocean freight rates. Authority is given for preferential rail and ocean rates on merchandise to be exported in American bottoms. The bill provides that no vessel enrolled under United States laws shall be sold to any save a citizen of the United States.

With the \$50,000,000 derived from the bond issue, not more than 600,000 gross tons could be provided at existing prices, or less than one-tenth of the

one-tenth of the tonnage necessary to make the United States a first-class maritime power, what prospect remains for the provision of a greater American general cargo carrying tonnage of the necessary tonnage by private capital? The willingness of capital to engage in ocean shipping is indicated by upward of 250 vessels now under construction in American ship building yards. Existing yards have been enlarged, abandoned plants revived, and new plants established to meet the abnormal demand for construction, but whether vessels now on the ways shall be permanently operated under the American or foreign flags, will depend upon whether such operation is profitable, and that in turn depends upon government policy.

#### Lack of National Policy

In what situation, therefore, does capital find itself when urged to gradually finance, at a cost of between half a billion and a billion dollars, the construction of 6,000,000 to 10,000,000 tons of steamships of various sizes and types? First of all, it finds this country without a definite policy. Whereas in England all policy, governmental and commercial, has long leaned toward shipping, American policy has ignored it. Until 1913 no vessel could fly the American flag unless built in the United States. The Panama canal act, in the hope of producing an American tonnage, which could avail itself of the waterway built by American skill and treasure, reversed this protective shipping policy and authorized the admission to American register, exclusively for the foreign trade, of foreign-built vessels no more than five years of age. But the increased cost of operating vessels under the American, as compared with foreign flags was so great that not one foreign-built ship was transferred until the war created abnormal conditions, offsetting the higher cost of operation, and the President, by congressional authority, suspended the most onerous restrictions of the navigation laws, while the chief incentive was to permit American-owned foreign-flag vessels to gain the protection of United States neutrality. This policy was also designed to enable American vessels to compete effectively with those of other nations, but was followed almost immediately by a proposal for government ownership and operation of vessels, which discouraged private capital, for it promised to interpose governmental competition regardless of profits, into the shipping situation.

Then came the seamen's act, designed to force the shipping of all foreign nations touching at American ports, to operate on the same high cost plane as vessels under the American flag, but

which, in actual operation, imposes certain restrictions on American vessels which do not apply to those of certain other nations. All of these policies were advocated "for the encouragement of the American merchant marine" but no two of them originated in the same quarter. None completely covered the needs of American shipping. Only one, the ship register act of Aug. 18, 1914, has been effective and that solely by reason of abnormal war conditions. Private capital has been confronted with a succession of promises and disappointments, an incomplete and changing legislative purpose.

The efforts of congress to deal with the subject have been sporadic and fragmentary, and it is not yet apparent whether the legislative mind desires to consider shipping as an industry which, when properly developed, will render economical service to American foreign trade, or as a service which should be so regulated as barely to exist. The pending bill, barren of encouragement for privately-owned shipping, appears to proceed from a desire for governmental repression of rates, on the principle that the use of American ports, improved at public expense, is a privilege equivalent to that of eminent domain enjoyed by a railroad, and therefore obliges vessels to governmental control. This seems to overlook the fact that port improvement, from the earliest times, has been designed to attract shipping. Any restriction in excess of those applying to shipping at competing ports will tend to nullify the benefits derived from enormous appropriations for deepening channels, lighting roadsteads and improving terminals, all of which attracted such numbers of vessels as produced steady competition for export freight. The substitute bill modifies the rate regulation in foreign commerce proposed by H. R. 10,500.

#### American Shipping at Competitive Disadvantage

It is urged that the application of the law alike to American and foreign vessels precludes discrimination and subjects the American ship to no disadvantage as compared with the foreign ship seeking cargoes from the same American port. American vessels, however, must also meet in their circuitous voyages the competition of foreign ships which never call at American ports, and therefore will never be subject to the seamen's act requirements as to manning and equipment, or to the proposed rate regulation of this bill. All American vessels will be obliged to meet the maximum requirements of the American laws, but only that portion of foreign shipping which calls at American ports will be similarly burdened. The struggle for survival would natur-

ally occur in trade wholly foreign to the United States, such as from the United Kingdom to South America, or Africa, or the Far East, between American ships complying with all our extreme navigation legislation and foreign ships permitted by their governments to operate on a competitive level with rival maritime enterprise. To live on our own export and import trade American tramp steamships must be able to live on the odd legs of the circuitous voyages necessary to avoid return in ballast. The fact that American shipping is now highly profitable is no criterion of its ability to compete during a shipping depression such as may follow a few years after this war and such as did follow the Boer war.

#### Effect of Regulation of Rates

Ocean shipping is the most competitive of industries; a constant struggle for existence, chiefly among nations for centuries engaged in maritime carrying. It is difficult to conceive success for the American entrant if burdened by legal restrictions not borne by the older and stronger opponents. In-so-far as such laws apply equally to American and foreign vessels they increase our freight rates and handicap our trade. If they do not apply to foreign vessels they drive our ships out of business. This proposed policy of regulation of ocean freight rates, springing, apparently, from dissatisfaction with existing abnormal rates, is expected to benefit American shippers, on the ground that they are not already sufficiently protected by the normal operation of the law of supply and demand. Admittedly abnormally high rates spring from a scarcity of ships. The following Associated Press dispatch sheds light upon efforts to control shipping by regulation of rates:

Manila, March 4, 1916.—Inter-island traffic is seriously affected by the withdrawal of a number of coastwise trading vessels which have accepted charters for foreign trade. Four of the ships have already left the local service and six others are preparing to leave. Foreign charter rates have been growing increasingly attractive, whereas local rates for transportation are stable, being fixed by laws.

The bill proposes to endow the shipping board with two inconsistent functions: that of ship owner and that of regulator of ocean steamship rates and practices. At the same time that the board is charged with a vindication of the policy of government ownership and a justification of the expenditure of \$50,000,000 either through operation of the ships by the government or through leases to private companies, it will have practically unlimited power to prescribe the rates and practices of its competitors. Such a condition is comparable

only to the unthinkable possibility of a single railroad in the United States being given the power to regulate the rates and practices of all its competitors.

Since export freight rates are, as a rule, paid by the purchaser and do not affect the seller unless they are higher than those enjoyed by an oversea competitor, a government rate-regulating policy would seem to thwart the advantage which the American exporter sometimes can obtain by a special rate sufficiently low to enable him to place his product in a foreign market at a lower price than his oversea competitor.

While the bill provides that preferential rates may be ordered by the shipping board, it is doubtful if this process would be sufficiently expeditious to

American export competition in a given neutral market would be deemed, by the competing countries, to be a discriminating policy, is a consideration not to be ignored. The possibility of reprisals should not be overlooked. This bill proposes on behalf of the United States an innovation in the "free ocean" conditions under which 45,000,000 tons of steam shipping has been established by the nations of the world in foreign trade, a considerable portion of which in time of peace has always been responsive to the needs of American exports and imports. The purpose of the proposed legislation is to supplement this responsiveness to the law of supply and demand with a certain compulsion, but it is greatly to

15,455.) now pending, which denies clearance only to vessels operated by ship owners or charterers guilty of oppressive practices, rebating, etc., and which provides for filing of conference agreements, etc., for approval or disapproval by the interstate commerce commission, and which forbids rebating, undue discrimination between persons and places, and authorizes the prescribing of maximum reasonable rates only when complaint has been made that rates in effect are unreasonably high or discriminatory. In other words, it provides a method for the elimination of abuses without attempting to cover the oceans of the world with a fabric of artificial rates, a task often considered but never attempted by nations with a far greater depend-

### How Foreign Trade Council Would Build Up American Marine

1—That congress establish a permanent shipping board, composed of five members, who shall be men experienced in shipping and foreign trade. This board shall recommend to congress such revision and modernization of all United States laws relating to shipping as it deems necessary and shall permanently discharge all the functions of the federal government relating thereto. This board shall constitute a permanent advisory body empowered to recommend to congress the measures necessary for the maintenance of United States shipping upon an equitable competitive basis with other nations, always having due regard for the maintenance of American standards of living and compensation, and keeping in view the needs of the national defense and the necessities of the foreign trade. To this end the board should be directed to ascertain the cost of construction and operation, rates of interest on shipping mortgages, insurance rates, etc., of American shipping as compared with that of other nations, and it should be its duty to determine what line of ocean-carrying trade shall be permanently developed under the American flag for the benefit of the foreign commerce of the United States, and to recommend methods whereby such lines may be rendered possible, in the event of the cost of their operation preventing effective competition with foreign services in the same zone.

2—That the board bring to the attention of congress the necessity of modifications of the speed requirements of the mail act of 1891 in special cases, so that the establishment of mail communications with South America,

South Africa, Australasia and the Far East may be considered from the several points of view of the cost of operation of such lines and of the speeds at which it is desirable that these lines be maintained.

3—That the board so constituted shall likewise report under the measures necessary to render investment in American shipping safe and attractive to private capital, and to increase the present resources of our systems of credit, as by the establishment of mortgage banks, to supply funds to the shipping industry for financing the construction of tonnage, and to throw around shipping mortgages such protection as to remove any apprehension on the part of investors regarding the safety of shipping propositions.

4—That the President be empowered to suspend the operation of such of the provisions of the seaman's act (applicable to American vessels, Nov. 4, 1915; foreign vessels, March 4, 1916), as he may consider detrimental to the interest of American shipping, until congress, having before it the advice of the shipping board, has revised and modernized the United States navigation laws; or if this suspension be deemed not expedient by congress, then that section 13 of the seaman's act be amended so as to eliminate the language test and the minimum percentages of able seamen among the deck crew, substituting therefor provisions equivalent to the requirements of the British merchant shipping act, and that the requirements of section 14 and annexed regulations concerning certificated lifeboat men, etc., be modified in conformity with the 1914 amendment to the British merchant shipping act.

meet the needs of competition with the shipping of other countries whose governments, after careful consideration, have declined to attempt the regulation of ocean freight rates. It is respectfully submitted that the control of ocean freight rates by exercise of power to deny clearance to foreign vessels, is a hazardous experiment, vastly different from the regulation of railroad rates in interstate commerce, where all carriers are equally subject to federal control.

In the increasingly keen competition for foreign trade, American vessel owners are at liberty to offer, and shippers to seek, the lowest possible rates for the extension of American trade in neutral markets. Whether an official shipping board's regulation of rates in such manner as to stimulate

be feared that the imposition upon all vessels clearing from American ports of requirements in excess of those prevailing at the ports of competing countries will drive away the carriers whose ample numbers normally (though not during the present war) produces a competition assuring reasonable rates.

Attention is called to the fact that after exhaustive investigation of ocean freighting conditions, rates and practices, the merchant marine and fisheries committee of the house of representatives deemed it wise to go no further, in regulation of water carriers in foreign commerce than is provided in the Bill H. R. 450, (The general provisions of H. R. 450 have been embodied in the substitute bill H. R.

ence than the United States upon marine transportation. H. R. 450 provides for no system of licenses. The fact that European maritime nations have, under war necessity, adopted a license system in order to retain the use of their national shipping in an advancing market, affords no basis of comparison for the delineation of an American policy in time of peace.

The stipulation that no vessel registered or enrolled under the laws of the United States shall be sold, save to an American citizen, is designed to prevent a principle universally characteristic of maritime development, namely, the sale of old ships to make way for new. A well organized merchant marine should consist of a large percentage of new vessels, the super-



ior efficiency of which is derived from lighter repair bills and lower insurance. Only the necessities of war caused the European maritime nations to forbid the alienation of their vessels. Such policy is unsuited to conditions of peace, and, in the case of the United States, will seriously detract from the value of shipping investments. That nation which has the fewer ships should be the last one to close its doors against selling its ships except in war times.

Your committee believes the present lack of clear, public comprehension of the problem involved in the upbuilding of American shipping is such as to render impossible national agreement upon any policy yet suggested.

The National Foreign Trade Council has recommended the establishment, by congress, of a permanent non-partisan shipping board, which shall advise congress as to the policy necessary firmly to establish a prosperous American shipping in the foreign trade. The need of such recommendation will remain, whether or not the pending bill becomes law.

It is true, the pending bill provides that the shipping board which it creates, consisting of the secretary of the navy, the secretary of commerce and three civilian commissioners, shall have power and authority "to gather and report to the President of the United States such information and data as will enable him to recommend to the congress legislation for the regulation of such commerce and for the promotion and development of the American merchant marine."

This investigatory function, however, is made secondary to the duties of expending \$50,000,000 and regulating all ocean transportation from American ports.

#### Council Remains Firm

The report on the merchant marine which the National Foreign Trade Council on Sept. 23, 1915, adopted, questioned the wisdom of a policy of government ownership and operation of merchant vessels, since which time the government proposal has been amended by a provision for private operation of government ships, and amplified by the provision for regulation.

After due consideration of the present bill the council sees no reason to modify its previous recommendations, which are herewith repeated, as necessary to the creation of a condition under which American shipping shall be freed from existing legislative restrictions which hamper it in competition with the vessels of other nations, to assure that no additional

handicaps be laid upon our commerce, and to enable a shipping board to recommend the complete policy necessary steadily to encourage its development. These recommendations are given in the accompanying box.

#### Buys Ore Boats

THE American Smelting & Refining Co. has closed a deal for the purchase of three large steamships for its South American business. One steamer was purchased in this country and two were bought in England. The vessels will be used in transporting material for the Chilian mining properties, probably bringing ore on the return voyage for the Tacoma smelter.

The price paid is said to be an average of \$700,000 for each steamship. It was necessary to have the ships outfitted and supplied with crews ready for sailing immediately from England when the purchase price was paid in order to avoid having the vessels commandeered by Great Britain. It is removed that some other ships which the company intended to buy a short time ago were commandeered as soon as the British government heard of the contemplated sale.

The American Smelting & Refining Co. has felt the scarcity of ships and has been obliged to provide for future contingencies. It is reported that the company can save in freights in a short time a sum sufficient to pay for the vessels. The present price of copper and the great demand expected after the war has brought about unusual activity in the development of the large mining properties of the company and one of the most serious handicaps has been the transportation problem.

#### Injunction Dissolved

JUDGE McPherson, in the United States district court, handed down an opinion refusing to grant the permanent injunction asked by the Lehigh Valley Railroad Co. to restrain the interstate commerce commission from enforcing its order requiring the railroad company to give up its interest in the Lehigh Valley Transportation Co., its water line operating on the Great Lakes. The decision has the effect of dissolving the temporary injunction granted by the court pending the final determination of the case.

Under the protection of the temporary injunction, the railroad company has been operating its lake line since the opening of the navigation season on the Great Lakes. Confident that its suit would be maintained, the

company expended many thousands of dollars putting its lake line in operating condition.

The order of the commission was made under the Panama canal act, which prohibits railroads from having any interest whatever in water routes with which they "do or may compete". The Lehigh company maintained that competition with its lake line was impossible, but rather than run the risk of paying \$5,000 daily fines, it applied to the interstate commerce commission for an inquiry whether there was competition between the two. The commission's finding was in the affirmative.

The railroad applied for an injunction, contending that, as its rail line extended from New Jersey to Buffalo, and its water route from Buffalo to Chicago, the latter was merely an extension of its rail line, and no competition was possible between them.

The government urged the point that the Lehigh company had a through rate with railroads with which it connected in Buffalo, and that these relations brought it within the categorical definition of having competition with its lake line. The commission found that the operation of the lake line by the railroad was for the purpose of keeping out competition on the lakes, thus allowing the Lehigh railroad to divert traffic to the rail lines with which it connected for the purpose of getting higher freight rates.

This is the first test case under the Panama canal law, and will be promptly appealed to the Supreme Court.

The steel barge POWEL, owned by the Baker Transportation Co., has been sold to New York purchasers for about \$40,000. POWEL will have tanks placed in her and will be used in carrying molasses in bulk from Porto Rico and Cuba to Philadelphia, under consignment to the Philadelphia Shipping Co. She was built at Port Richmond, N. Y., in 1900, and has been engaged in the coast trade. She is 206½ feet long, 35 feet beam and 19½ feet depth of hold.

Two big freighters will be added to the trade between Puget Sound and the Orient. They are KIFUSAN MARU, a new liner whose paint hardly is dry, and HUDSON MARU, a ship that has cruised in that part of the world before.

The ships have been chartered by Frank Waterhouse & Co. They are scheduled on the July sailing list. KIFUSAN MARU, now in Japan, will ply between the Sound and Japan and Hong Kong. HUDSON MARU, which is at Havant, is due to carry freight to Vladivostok.

# What the Government is Doing

Rulings on Marine Matters

Improvements to Waterways

Hints to Navigators

## How American Ports Are Developed ✓

THE remarkable development of American ports during the last five years is discussed in a comprehensive bulletin just issued by the bureau of foreign and domestic commerce, department of commerce. This rapid development is attributed to the recent commercial growth of the country, to the building of the Panama canal, and to the tendency of congress to require communities receiving federal appropriations for river and harbor work to co-operate in making the improvement or to provide public terminals.

American ports are better suited by nature to handle the largest liners than any of the old-world ports. The author of the report, Commercial Agent Grosvenor M. Jones, states that there are four American ports—New York, San Francisco, Seattle and Tacoma—where it is possible to dock boats as large as Aquitania and Imperator at any stage of the tide, and in Boston such boats can proceed to the wharves at high tide. The great majority of our ports along the seaboard are actually located on rivers, some of the most important ports reached by ocean-going vessels being located far inland. Thus New Orleans is 106 miles from the Gulf of Mexico, Philadelphia 105 miles from Delaware Bay, and Baltimore 151 miles from Hampton Roads. Other ports located a considerable distance inland are Brunswick, which is about 13 miles from the ocean; Hartford, about 52 miles; Houston, 50 miles; Jacksonville, 27½ miles; Mobile, 30 miles; Port Arthur, Tex., about 17 miles; Portland, Ore., 112 miles; Richmond, 104 miles; Sacramento, 111 miles; Savannah, 26 miles; Washington, D. C., 195 miles; Wilmington, Del., 82 miles; Wilmington, N. C., 36 miles.

Mr. Jones has confined his attention to those ports having a water-borne commerce amounting to 1,000,000 short tons in volume or \$30,000,000 in value. There are 68 ports of this importance in the United States, 23 on the Atlantic coast, eight on the Gulf of

Mexico, 10 on the Pacific coast, two on the Ohio river, and no less than 25 on the Great Lakes. Only New Orleans, San Francisco, Los Angeles, San Diego, Oakland, Sacramento, Stockton and Washington, D. C., own the major portion of their water fronts or are in a position to acquire the bulk of it. These are the only ports of the 68 studied in which the public interest is dominant. Six of these eight ports are located on the

### Rig Old Timers

*THE scarcity of vessels for neutral shipping has reduced ship companies to extraordinary straits. An example of this is found in a report from Copenhagen which states that MARIE, of Troense, built in 1776, and TVENDE BRODRE, built in 1786, have been rigged up and sent out to enter the competition for the enormous freight rates which are now being offered. So great is the demand for bottoms that anything that can be floated is being pressed into service.*

Pacific coast. Although at each of the other ports the frontage owned and controlled by the state or city is less than one-half of the total available frontage, it usually represents a substantial interest. This is true of the ports of New York, Philadelphia, Boston and Baltimore on the Atlantic coast, and of Seattle and Tacoma on the Pacific coast. During recent years, Baltimore, Boston, Hartford, Jacksonville, New Bedford, New London, Pensacola, Philadelphia, Providence, Portland, Ore., Seattle, Tacoma and Tampa have increased their publicly owned waterfront property.

The majority of the seaboard ports mentioned in the report own public terminals, New Orleans and San Francisco leading in this respect. At both of these ports the entire water front is not only publicly owned or subject to expropriation at any time for public use, but is also largely im-

proved by a system of public terminals under immediate public control. At both these ports the terminals are co-ordinated by belt-line railways, also under public control. New York owns the greater part of the most important frontage at that port and has constructed a large number of excellent piers, practically all of which have been leased for long terms to private individuals. Pier rentals yield the city a handsome revenue.

Boston has the most expensive as well as the largest pier in the United States, if not in the world. Commonwealth Pier No. 5 has cost about \$4,000,000 and is 1,200 feet long and 400 feet wide. Boston will soon have another distinction—that of owning the largest dry dock in the western hemisphere, as work has been begun on a dry dock 1,200 feet long.

Cincinnati and Pittsburgh, the two Ohio river ports mentioned in the report, have long maintained public terminals which have an interesting history. At Pittsburgh the frontage used for the public terminals was granted for that express purpose by the heirs of William Penn, while the frontage now occupied by the public levee at Cincinnati was expressly dedicated to that use in the ordinance of 1787 creating the Northwest Territory.

The report discusses at some length the increasing influence of the federal government upon port development. This is attributed to the fact that the government contributes large sums for improving harbors, thus placing in the hands of congress an important though indirect power. Frequently appropriations for local improvements are made subject to the performance or non-performance of certain acts on the part of the locality benefited. A marked tendency in river and harbor bills in recent years is to require localities seeking aid to contribute toward the expense, or to provide public terminals. In recent years the interstate commerce commission has been given powers which if exercised may profoundly af-

fect the development of ports in this country. Section 6 of the act to regulate commerce, as amended by the Panama canal act of Aug. 24, 1912, gives the commission power to establish "physical connection between the lines of rail carrier and the dock of the water carrier by directing the rail carrier to make suitable connection between its line and a track or tracks which have been constructed from the dock to the limits of the right of way, or by directing either or both the rail and water carrier, individually or in connection with one another, to construct and connect with the lines of the rail carrier a spur track or tracks to the dock." The commission has full authority to determine the terms and conditions upon which these connecting tracks shall be operated and may determine what sum shall be paid to or by either carrier.

The report is entitled "Ports of the United States", miscellaneous series No. 33, and contains 431 pages, the bulk of which is taken up with a detailed analysis of the facilities of the individual ports. There is also a summary of the results obtained through Mr. Jones' investigation, 21 maps and four appendices, one of which is the schedule used in obtaining the information upon which the report is based. A nominal price of 75 cents has been placed on the report, for which sum it may be purchased from the superintendent of documents, Washington, or from any of the district offices of the bureau of foreign and domestic commerce.

### Rules Are Revised

Few specifications for electrical installation contracted for after June 30, 1916, on the vessels coming under the jurisdiction of the service which use electricity for lighting have been adopted by the board of supervising inspectors of the United States steamboat inspection service. The specifications read as follows:

"On all vessels contracted for after June 30, 1916, using electricity for lighting, the installation shall be in keeping with the best modern practices. Wires shall be run in approved iron conduits, armored casing, or molding. Iron conduit or armored casing shall be required in bunkers, cargo spaces, storerooms, etc., and in all places where the leads are liable to mechanical injury. Joints in wiring shall be avoided as far as possible in the above-named places. Where wires are led through beams, frames, or non-watertight bulkheads, they shall be carried either in iron conduits, armored casing, or protected by hard

rubber, or other equivalent bushings. Where wires are carried through watertight decks or bulkheads, they shall be provided with a suitable stuffing box at deck or bulkheads. Where such points are liable to mechanical injury, they shall be protected by suitable boxes or cages.

"In locating the wiring system as a whole, care should be taken to provide accessibility for examination and repair. Special care shall be taken to avoid any arrangement which might permit the lodgment of standing water.

"All taps, joints and splices shall be fitted with water-tight junction boxes.

"Joints shall be so spliced or the parts so joined as to be both mechanically and electrically secure without solder. They shall then be soldered and properly insulated and further protected by water-proof tape.

"Changes or alterations in the electrical installations of vessels now in service shall be in accordance with this rule.

"Special attention shall be given by the inspectors in the examination of present installation to see that it is of such nature as to preclude any danger of fire, giving particular attention to wiring which is carried through wooden bulkheads, partitions, etc."

### Deficit is Increased

The tolls from traffic through the Panama canal in February amounted to \$834, while the costs charged to the operation and maintenance of the canal during that month amounted to \$609,253.66. This makes a deficit for the month of \$608,419.66 and brings the loss in this account for the current fiscal year to \$3,058,795.87.

The tolls collected during the current fiscal year, to March 1, with the canal in operation during June, July, August, and the first half of September, and closed to all but small vessels since, amounted to \$1,431,970.39. In the preceeding fiscal year they had amounted to \$2,287,969.64 up to March 1. During this fiscal year the expenses of operation and maintenance, especially the latter element, have exceeded the expenses for the same period last year by \$1,895,152.93. The deficit of the fiscal year to date is practically 10 times as great this year.

The heavy increase in expenses during the current fiscal year has been due principally to dredging work for maintaining the channel through Gailard cut. This has regularly amounted to over one-half of the total costs for operation and maintenance. It has been practically twice as much during

this fiscal year as during the same period of last year.

"Operation and maintenance" does not cover the entire canal expenditures, but covers the cost of operations designed to keep the canal open and in order, and those necessary to the work of handling ships through; and a proportion of overhead expenses (approximately one-third of the total for the canal organization), being costs of sanitary work, civil government, and administration.

### Certificates Issued

The steamboat inspection service has issued certificates to 19,959 able seamen under the La Follette act, according to figures made public by the department of commerce. The number of certificates issued to seamen on the Atlantic coast is 9,218, nearly half of the total number issued. Able seamen on the Pacific have received 5,236 certificates, while 4,113 men have qualified on the Great Lakes. Only 1,392 certificates were issued at Gulf ports. The issuing of certificates is as follows:

#### ATLANTIC PORTS.

New York, N. Y.	4,530
New Haven, Conn.	46
Philadelphia, Pa.	869
Norfolk, Va.	636
Baltimore, Md.	895
Charleston, S. C.	20
Jacksonville, Fla.	109
Savannah, Ga.	120
Boston, Mass.	948
Bangor, Me.	104
New London, Conn.	75
Portland, Me.	248
Providence, R. I.	627

Total ..... 9,218

#### PACIFIC PORTS.

San Francisco	3,126
Honolulu, H. I.	468
Juneau, Alaska	9
Los Angeles, Cal.	368
Portland, Ore.	271
St. Michael, Alaska	1
Seattle, Wash.	1,114

Total ..... 5,236

#### GREAT LAKES PORTS

Detroit, Mich.	369
Chicago, Ill.	697
Duluth, Minn.	706
Grand Haven, Mich.	54
Marquette, Mich.	81
Milwaukee, Wis.	475
Port Huron, Mich.	254
Cleveland, O.	721
Buffalo, N. Y.	551
Oswego, N. Y.	126
Toledo, O.	139

Total ..... 4,113

#### GULF PORTS.

New Orleans, La.	479
Apalachicola, Fla.	106
Galveston, Tex.	403
Mobile, Ala.	336
San Juan, P. R.	68

Total ..... 1,392

\* Incomplete.

The S. Flory Mfg. Co., Bangor, Pa., has issued a folder, describing its hoisting apparatus, including the Flory steam-driven capstan. The latter is built with a cone or band friction and with a throttle or link reverse.



# Evans Heads Baltimore Ship Yard

Reorganization of Baltimore Dry Docks & Shipbuilding Co. Results  
in Election of Holden A. Evans President—Plant Will Be Enlarged

WITH the retirement of Thomas H. Bowles as president of the Baltimore Dry Docks & Shipbuilding Co., Baltimore, Md., and the purchase of the properties of the company by the Wisconsin Securities Co., Milwaukee, comes the election of Holden Allan Evans as president of the company under the new management.

Mr. Evans was born in Greenville, Ala., on Dec. 6, 1872. He was appointed to the naval academy at Annapolis from Florida in 1888, graduating in 1892 as honor man in his class. He was appointed to the naval construction corps and was sent to the University of Glasgow to complete his studies in naval architecture and marine engineering. Mr. Evans graduated from the university with the university's certificate of "Great Distinction," having previously taken the class prizes for two years. In May, 1897, he was commissioned assistant naval constructor, U. S. N., and was assigned to the works of the Newport News Dry Dock & Shipbuilding Co., Newport News, Va., in connection with the supervision of work in connection with the building of U. S. naval vessels. At the outbreak of war with Spain, Constructor Evans was assigned to take charge of hull repairs at Key West on vessels damaged in connection with the Cuban blockade. After the war Constructor Evans was appointed superintending constructor at the plants of the Crescent Shipbuilding Co. at Elizabeth, New Jersey, and the Chas. L. Seabury Co. at Morris Heights, New York. Constructor Evans was then appointed to the Norfolk navy yard, where he remained five years, from 1899 to 1904.

Mr. Evans was then promoted to naval constructor and assigned to the Mare Island navy yard, California. During his incumbency at Mare Island, Constructor Evans proposed to the secretary of the navy, Mr. Newberry, a plan of re-organization, whereby the military and construction or technical departments of the yard were to be

separated. This plan was approved by Mr. Newberry and was put into force with great success until a change in the cabinet put George von L. Meyer in as secretary of the navy. Under Secretary Meyer's administration military control of the entire yard was re-established. Since, during the present Daniels' administration, it is interesting to note that Mr. Evans' original plan is



HOLDEN A. EVANS

being used without any modification. In 1910 Mr. Evans resigned from the navy to be vice president and general manager of the Seattle Construction & Dry Dock Co., Seattle, Wash.

In 1914 Mr. Evans was made general manager of the Skinner Shipbuilding & Dry Dock Co., Baltimore, by the bondholders committee. When the Skinner company was sold and the Baltimore Dry Docks & Shipbuilding Co. formed Mr. Evans was made vice president and general manager, which position he has held until the present. Mr. Evans is a man of unusually strong character and has made many friends since his con-

nection with the Baltimore company. The Wisconsin Securities Co., together with Mr. Thomas H. Bowles, has purchased the Baltimore company. Included in the Securities company are Patrick Cudahy, president of the Cudahy Packing Co.; Gustav Pabst, president of the Pabst Brewing Co.; Charles A. Albright, head of the medical department of the Northwestern Mutual Life Insurance Co.; John I. Biggs, for many years head of the St. Louis street railway system and now manager of the interests of the Wisconsin Securities Co. in Missouri; William Bigelow, vice president of the First National Bank of Milwaukee; Robert Camp, president of the First Trust Co. of Milwaukee; O. C. Fuller; Howard Green; John W. B. Lombard; Geo. P. Miller; Ludington Patton, president of the Patton Paint Co.; L. J. Petit, president of the Wisconsin National Bank and of the Petit Salt Co.; Chas. F. Pfister, president of the Pfister & Vogel Tannery, and of the Hotel Pfister, and Frederick Vogel Jr. As the men interested are associated with large moneyed interests in the west, an extensive development of the yards and ship building plant at Baltimore is expected. Connected with the new ownership of the company is the purchase of 116 acres of water front property in Anne Arundel county adjacent to the city of Baltimore. Although this purchase is accredited to Mr. Bowles, he has refused to affirm or deny the report. Mr. Bowles will continue to be a member of the board of directors of the new company.

The ship building plant of the Robert Palmer & Son Ship Building Co. at Noank, Conn., has been purchased by Chas. W. Morse and associates after prolonged negotiations. It is expected that the plant will be re-equipped and placed in shape for building wooden and steel vessels of a larger type than heretofore.







# New Steamer for Molasses Trade

Sucrosa is Designed Along New Lines That Permit  
Either Molasses or Petroleum to be Carried in Bulk

THE steamer SUCROSA, launched Saturday, May 6th, from the yard of the Fore River Shipbuilding Corporation, Quincy, Mass., is a steel tank steamer for the Cuba Distilling Co., of New York, designed primarily for the carriage of molasses in bulk, but so arranged that she may be employed in the carriage of bulk petroleum.

SUCROSA is a two-deck vessel, with poop, bridge and forecastle, and is of the following dimensions: Length between perpendiculars, 389 feet, breadth, 54 feet, 6 inches, depth to upper deck, 32 feet, 6 inches. She will carry about 1,500,000 gallons of molasses on a mean draft of 25 feet.

As this vessel collects her cargo from Cuba and the neighboring islands, special attention has been given by the builders to the question of accommodations for the officers and

crew. The quarters for the navigating officers, together with those for the wireless man and chief steward, are located under the bridge deck, so that easy and rapid access can be had to the bridge at all times; the quarters for the engineering officers are located in a Liverpool house around the engine casing on the poop deck, while those for the oilers and firemen are located below the poop deck.

Unlike the usual design of tank vessel, SUCROSA has a deep double bottom all fore and aft and the inner bottom is recessed at the after end in each of the 18 cargo holds to form suction pockets to facilitate discharge. When carrying molasses, the deep tanks above the inner bottom only will be employed, but oil will be carried both in the main cargo tanks and in the double bottom tanks, thus

permitting the carriage of 2,500,000 gallons of oil on the same draft as that given above for the molasses.

For discharging the cargo there is a pump room amidships, in which are located an 18 x 12 x 18-inch horizontal duplex cargo pump and a 16 x 10 x 18-inch duplex ballast pump, so interconnected that both pumps may be employed in clearing the main tanks, or one pump may be employed on the main tanks and the other on double bottom tanks simultaneously. These pumps are connected to a 14-inch main line all fore and aft, from which are led 12 branches to each tank, so arranged that the liquid cargo may at any time be transferred from one tank to the other through the pumping system.

The propelling machinery consists of one vertical triple expansion en-

## How the Rigging of a Modern Freighter is Arranged

*The arrangement of the rigging of a modern steam cargo carrier bears little resemblance to that prevailing in the "days of sail." An excellent example of present methods of rig-*

*ing a ship is found on the new steamer SUCROSA, recently built and launched by the Fore River Shipbuilding Corporation for the Cuba Distilling Co. The complete rigging*

*of this vessel is shown in the illustration on the facing page. The identifying numerals in the following table refer to corresponding numbers in the illustration:*

No.—Name.	Material.	No.—Name.	Material.
1 Forestay .....	3½-in. S.W.R.	47 9-in. Sgl. block rev. ups. S. & B.....	Wood
2 Jumper stay .....	3-in. S.W.R.	48 8-in. Sgl. block, reg. S. & B.....	Wood
3 Foremast shrouds .....	2½-in. S.W.R.	49 8-in. Sgl. block rev. ups. S.....	Wood
4 Mainmast shrouds .....	2½-in. S.W.R.	50 4-in. Sgl. ins. strap & Sis. H'k.....	Wood
5 Mizzenmast stay .....	2-in. S.W.R.	51 Pad for shrouds F. & M. masts.....	M. S.
6 Mizzenmast shrouds .....	2-in. S.W.R.	52 Pad for mizzen stay and shrouds.....	M. S.
7 Masthead band .....	M. S.	53 1½-in. heavy pipe turnbuckle.....	Steel G.
8 Spreader .....	S. C.	54 1½-in. heavy pipe turnbuckle.....	Steel G.
9 Mizzenmast head band.....	M. S. galv.	55 1½-in. heavy pipe turnbuckle.....	Steel G.
10 Mizzenmast topping lift band.....	M. S. galv.	56 1½-in. heavy pipe turnbuckle.....	Steel G.
11 Mizzenmast gooseneck band.....	M. S. galv.	57 1-in. heavy pipe turnbuckle.....	Steel G.
12 Mizzenmast gooseneck band.....	M. S. galv.	58 1¼-in. shackle .....	W.S.G.
13 5-ton derrick boom.....	Oregon pine	59 1½-in. shackle .....	W.S.G.
14 3-ton derrick boom, mainmast.....	Oregon pine	60 1-in. shackle .....	W.S.G.
15 3-ton derrick boom foremast.....	Oregon pine	61 ¾-in. shackle .....	W.S.G.
16 Mizzen derrick boom.....	Oregon pine	62 ¾-in. shackle .....	W.S.G.
17 5-ton topping lift.....	4½-in. Manila	63 Shackle for forestay.....	M. S.
18 3-ton topping lift.....	4-in. Manila	64 6½-in. D. sheave for gantlines.....	C.I. galv.
19 Mizzen topping lift.....	3-in. Manila	65 5-in. D. sheave for gantlines.....	C.I. galv.
20 5-ton derrick falls.....	"Dur." S.W.R.	66 Mastlight bracket.....	M. S.
21 3-ton derrick falls.....	"Dur." S.W.R.	67 Range light bracket.....	M. S. galv.
22 Mizzen derrick falls.....	3½-in. Manila	68 9-in. D. Ball.....	Lig. vitae
23 5-ton boom vang.....	3-in. Manila	69 6-in. D. Ball.....	Lig. vitae
24 3-ton boom vang.....	2¾-in. Manila	70 Ensign staff .....	Oregon pine
25 Mizzen boom vang.....	2½-in. Manila	71 Jackstaff .....	3½-in. pipe
26 Boom vang pendants 5-ton.....	2¼-in. S.W.R.	72 Halyards for jack and ensign staffs.....	¾-in. cotton
27 Boom vang pendants, 3-ton and mizzen.....	2-in. S.W.R.	73 Masthead halyards .....	12 thd. Manila
28 Pad for 3-ton topping lift.....	M. S.	74 Signal halyards .....	12 thd. Manila
29 5-ton gooseneck bracket.....	S. C.	75 Anchor light halyards.....	12 thd. Manila
30 3-ton gooseneck bracket.....	S. C.	76 Stay eye .....	C. I. galv.
31 14-in. Tbl. block reg. S.....	Wood	77 14-in. cleat .....	C. I. galv.
32 14-in. Tbl. block reg. S. & B.....	Wood	78 Pad for boom vang.....	M. S.
33 12-in. Dbl. block reg. S.....	Wood	79 Pad for funnel guys.....	M. S.
34 12-in. Dbl. block reg. S. & B.....	Wood	80 Funnel guys .....	2¼-in. S.W.R.
35 10-in. Dbl. block reg. S.....	Wood	81 Band for wireless.....	M. S. galv.
36 10-in. Sgl. block reg. S. & B.....	Wood	82 Gantlines .....	2½-in. Manila
37 14-in. Tarbox W. R. block reg. S. (Dbl.).....	Steel	83 Cleat for jackstaff.....	C. I. galv.
38 14-in. Tarbox W. R. block ups. SW. S.....	Steel	84 70-in. ball and hook.....	Steel
39 14-in. Tarbox W. R. block swiv. S.....	Steel	85 Rail pad .....	C. I. galv.
40 14-in. Tarbox W. R. block reg. S. & B.....	Steel	86 Cap .....	C. I. galv.
41 14-in. Tarbox W. R. block swiv. S. & B.....	Steel	87 Pad eye .....	M. S.
42 10-in. Snatch block .....	Steel	88 10-in. Dbl. block rev. S.....	Wood
43 12-in. Sgl. block swiv. hook & B.....	Wood	89 12-in. Dbl. block rev. S. & B.....	Wood
44 12-in. Sgl. block reg. S.....	Wood	90 20-in. cleat .....	C. I. galv.
45 10-in. Sgl. block, rev. ups. S. & B.....	Wood	91 15-in. cleat .....	C. I. galv.
46 9-in. Dbl. block reg. S.....	Wood		

gine driving a right-hand propeller. The cylinders 25 x 41 x 68-inches in diameter, having a common stroke of 48 inches.

Steam will be supplied at a pressure of 190 pounds per square inch from three single-ended boilers, 14 feet, 2 inches mean diameter by about 11 feet 10 inches long, having a total heating surface of 7,407 square feet.

### Limit Draft on Lakes

THE war department, through Col. Mason M. Patrick, U. S. A., Detroit, has issued instructions regarding the navigation of Lake St. Clair, in order to avoid stranding. An official communication on this subject from Col. Patrick is as follows:

"Investigation has shown that there has been considerable shoaling in Lake St. Clair, particularly just below the St. Clair Flats canal. Dredging is in progress at present to remove this shoaling and very satisfactory progress is being made. The worst of the shoaling has been already removed, the dredging having been carried over about one mile below the lower end of the west, or downbound canal.

"It is still believed to be unsafe for vessels to traverse Lake St. Clair when drawing more than 19 feet 9 inches and the load draft of such vessels is restricted accordingly.

"In view of the fact that on the run from the Soo to Lake St. Clair the fuel consumption will somewhat lessen the load draft, as observed at the Soo, by the time the vessel reaches the St. Clair Flats canal, instructions have been issued to detain at the Soo any vessel which is loaded to more than 19 feet 11 inches. Vessels upbound will likewise be loaded so that when crossing Lake St. Clair they will not draw more than 19 feet 9 inches.

"The above restrictions upon the vessel draft are solely with a view to promoting safety and to prevent the serious results which might follow a stranding in the Lake St. Clair channel particularly at this time when everything must be done to reduce to a minimum the delays which boats experience. It is hoped that all vessel owners and vessel masters will co-operate in the effort to prevent such delays. The restrictions upon the load draft will be enforced."

The Joseph Dixon Crucible Co., Jersey City, N. J., is distributing a booklet describing the use of graphite for cylinder lubrication. The adaptation of graphite for use with marine, gas and steam engines and with compressors is described. A number of testimonial letters are included, one of which details a saving of 52½ per cent in the cost of lubrication.

## Standardization Boosted

### Uniform Type of Construction Recommended for Freight Vessels by Engineer

STANDARDIZATION in the construction of freight ships is advocated in a special paper prepared for the department of commerce by E. Platt Stratton, consulting engineer of the New York board of underwriters and formerly supervisor of the American bureau of shipping. The subject is one to which considerable attention has been drawn since the ship building boom arising from the war and the expansion of demand for an American merchant marine have gripped the country. The standardization of ships was advocated in the editorial comment appearing in the June issue of *The Marine Review*.

Already several yards have adopted the plan of turning out standard vessels and it is generally recognized that if specialization of this type could be introduced into the industry, it would be placed upon a much more efficient basis, as indicated by the development of foreign yards where standard ships have been turned out. Mr. Stratton says:

"Signs multiply of a disposition in the United States so to standardize the construction of cargo types of steamships as greatly to reduce their cost.

"In the construction of ships for carrying passengers and freight and in the construction of the higher class swift leviathans that carry passengers, mails and express, standardization is not always practicable. But in the construction of the higher types of ships the United States is not as far behind ship yards of other countries in the matter of cost as it is in the construction of the purely cargo type of ship.

"Cargo steamships of from 1,000 to 10,000 tons deadweight capacity, on a block coefficient of from 75 to 80 per cent of the cube of their length, breadth and depth, and a standard rate of speed not to exceed 12 knots, is the trend and the type of ship most useful for general trade. Such vessels are now built with double bottoms for the carriage of water ballast, which have become more and more of a necessity to facilitate the handling of the ships when light or in motion without cargo. Double bottoms also offer great facility for the storage and use of any of the varieties of liquid fuel, which frequently are found to be more advantageous,

if not more profitable, than coal, particularly when the cost of stowing it in the ship's bunkers and the cost of firing it with man power are considered.

"All liquid fuels are piped direct to the furnaces, fed and sprayed into them under pressure which makes the fuel supply and combustion constant and uniform, thus doing away with all inequalities of steam pressures incident to replenishing, slicing and cleaning of fires when coal is the fuel being utilized. It should be here noted that much of the space contained within double bottoms exists between the floors of the ship which internally support the bottom plates of the vessel, and while this space exists between the ceiling of the ship's hold and the outer plating on the vessel's bottom absolutely no use was ever heretofore made of it except as a receptacle for the accumulation of bilge water. In the double bottom, therefore, it will be seen that liquid fuel utilizes a space for its storage that was not and could not be utilized for any other purpose, since many parts of the internal portion of the double bottom are quite inaccessible to the hand or the eye after such portion of the ship has been constructed.

"Vessels of the double bottom type of construction have also had a tendency greatly to reduce marine insurance risks incident to the transportation of all kinds of dry and perishable cargo, for in ships of this type of construction, on taking to the ground below the turn of the bilges, it is very seldom that a puncture extends through both the outer and inner shell of the double bottom in a single contact. And before water can reach the cargo this condition most invariably assures the salvage of the cargo before the vessel's floors and frame can be forced up to rupture the inner shell of the double bottom, which generally continues to exist intact not only until the cargo is salvaged but the vessel itself floated for repair. Marine insurance statistics are full of such instances of only partial loss under general average where previously nothing but the total loss stared underwriters in the face when a vessel with a single bottom grounded, under whatever conditions.

"Incidentally, think what would be the cost, detention or protracted de-

lay if our elevated structures, various types of railway and highway bridges, fireproof hotels, storehouses, great railroad stations and depots were built on the ground they are intended to occupy and after the manner in which many of our shipyards now prepare ship materials and assemble them in the finished structure.

#### Construction Facilities Excellent

"The golden opportunity is therefore now open here in the United States for the systematic development of a method of ship construction never equaled in this or in any other country, however advanced or developed. For primarily our iron deposits are of the higher order both in quality and quantity, which will always insure the best shipbuilding material at prices that can and will probably always equal any competition from whatever source it may come, and on a scale unequaled in any other quarter of the globe. Our facilities for construction exist both inland and coastwise, and are unexcelled by any other commercial nation, and conditions are now existent and urgent for an immediate increase of the nation's merchant marine, on a large, if not on a heroic scale. The golden opportunity is therefore open for some of our great steel plants to develop a thoroughly well-standardized and efficient system of supply of dimension materials, shaped and punched, ready for assembling in the hull of any standard ship of specific dimensions at tidewater, or where the fabricated mass can be launched or floated.

"Such a system of standard ship construction anticipates standard models, on fixed schedules of scantling, for a vessel throughout of fixed coefficients of fineness. Starting, say, with 1,000 tons deadweight capacity, and a coefficient of 75 per cent of the vessel's length, breadth and depth, the next of like dimensions and of, say, 80 per cent coefficient, and so on, in like dimensions for vessels of two, three, four, five, six, seven, eight, nine and 10 thousand tons each, such vessels to be built to standard schedules of scantling, approved, when designed to government and underwriting requirements, thus assuring acceptance under all conditions for any navigation of the globe and the transportation of dry and perishable cargoes under any conditions existent in any part of the world. Such standardized vessels should be modeled on demonstrated lines of efficiency and least resistance from tank experiments, as was demonstrated years ago in England by the great engineer and scientist, William Froude, and more recently brought down to practical re-

sults under Mulford, of William Denry & Sons, of Dumbarton, but in no such elaborate and successful manner as now practiced at the Washington navy yard under the supervision of Admiral David W. Taylor, chief constructor of the navy.

"In this connection it may be well to note the great progress being made in the engineering field with internal combustion engines, both in this country and in Europe. These internal combustion engines now offer assistance of as good or better results than are now produced by steam engines, and on a much less weight per horsepower developed. The great curtailment in the number of large modern cargo carriers, incident to the destruction and loss during the European war, is calculated to make immediate development of American ship building industry necessary, if not urgent, in the production of efficient cargo ships by the most wholesale method possible. This suggests the advantage, if not the necessity, of the restoration of our ship building industry at its source, namely, the steel works, from which all the members of the structure emanate.

#### Standardization Means Increased Profits

"It is a generally recognized principle of manufacture that standardization of output invariably increases profits to producers. In English shipyards it is recognized that as small a number as three ships, constructed in the same yard and exactly similar in all respects, can be produced for 15 per cent less per ship than if built separately. Therefore, a well worked out system of standardization in the construction of freight ships should, without a doubt, produce as good or better results. Many experts, whose opinions are entitled to great consideration, fix the saving much higher.

"Modern experience in shipbuilding shows that such methods have been successful in Great Britain, and with the increasing demand for American tonnage the prospects of similar achievements in this country are encouraging. Naval architects of international renown are indorsing the suggestion and hope to see an early start in this direction made in the United States. In fact, the idea has already been initiated in the United States, ships having been constructed in an Atlantic coast ship yard, then taken apart, shipped to the Pacific coast, and there re-assembled into the finished ships.

"As our country's great steel works now possess facilities and capacity for the perfection of the various details of ship construction herein referred

to and outlined, they can doubtless quickly bring the United States to the front as the first ship building nation of the earth in the production of standard cargo-carrying steamships, to which our unlimited quantities of high quality but cheap materials will greatly contribute. With standardized cargo carriers thus under great headway our shipyards gradually will become more and more expert in the construction of all types of merchant ships that go to make up a general marine. The opportunity and all of the accessories requisite and necessary for American success are ours".

#### New West Indian Line

Alfred Weller, for many years freight manager of the Quebec Steamship Co., has resigned to accept a similar position with the Rapurel Steamship Co., E. M. Raphel & Co., agents, New York.

The latter company, which has been operating a direct steamship service between New York and Cayenne, French Guiana, for the past year, has decided to establish a regular line from New York to Haitien ports, the Windward Islands and Demerara. The first sailing in the new service was the American steamer ELIZABETH WEEMS, which cleared for Port au Prince, St. Marc, Jacmel, Gaudeloupe and Martinique. This boat was followed by ERIC II, which sailed for Haitien ports, Guadeloupe, Dominica and Martinique the IMPERATOR for Demerara direct.

The company has acquired new Pier 1, North River, Battery place, as a loading berth.

#### Pennsylvania Commissioned

The new superdreadnaught PENNSYLVANIA came to the Norfolk navy yard recently from her builders at Newport News, with Captain H. B. Wilson commanding.

With her 12 14-inch rifles, four 21-inch torpedo tubes and 22 5-inch guns, the PENNSYLVANIA is considered by American experts the most powerful warship afloat. She displaces 32,000 tons. A description of the trial tests of PENNSYLVANIA appeared in a recent issue of *The Marine Review*.

The Russian embargo on cargoes, to the port of Archangel, other than those consigned to the government, is seriously affecting shippers here. Fully 23 vessels, it is asserted, are tied up in the port of New York because they cannot get permits to enter Archangel. Some of these vessels are already loaded and the others are ready to load, all with ordinary commercial products.

# American Ship Yard Activities

A Snappy Summary of the Leading Events of the Month in the  
Vessel Construction Field

## Schooners for West Coast Lumber Trade

By R. C. Hill

THE demand for tonnage adapted for carrying lumber from Pacific coast ports has resulted in unprecedented activity in western ship yards. At the present time there are at least 37 wooden auxiliary schooners, under construction on the Pacific coast. This new tonnage will have a capacity of approximately 52,100,000 feet of lumber. One of these vessels has already been launched at St. Helens, Oregon, although the majority of them will not be ready until the last three months of 1916. While constructed primarily for lumber, these vessels will be equally available for transporting coal, ore or other heavy cargo. Those familiar with the lumber export business believe that this type of vessel is destined to do the bulk of the lumber carrying business from the North Pacific ports in the future. Most of the new vessels in question are to be five masted and will be equipped with sails as well as oil burning engines of sufficient horsepower to propel them in calms or adverse winds. It is believed the auxiliary power schooners can be operated much more economically than any other type of vessel.

### Foreign Tramps Desert

Until recent years the export lumber trade of the North Pacific was handled largely by American sailing vessels, a majority of them schooner rigged, although the barks and barkentines also were utilized. More recently tramp steamers of foreign registry, many of them carrying from 2,500,000 to 4,500,000 feet of lumber, have monopolized the export business. The war has attracted these steamers to other trade routes. The result has been that American sailing ships suitable for lumber have been in extraordinary demand for more than a year, at rates heretofore unheard of. Vessels which have lain idle for years, abandoned because they were unseaworthy and antiquated, have been recalled to service, put into condition and chartered at exceedingly high rates. These conditions have caused capitalists and mill owners to look to the future with the idea of providing tonnage to take care of the lumber available for export from

this coast. The auxiliary power schooner has been selected as well adapted to the trade.

While every ship yard along the west coast specializing in steel construction has one or more steel steamships under way, the activity in wooden construction is one of the features of the present extraordinary situation. The following summary of construction work at various yards on the Pacific coast will give an idea of the amount of new tonnage



STEAM SCHOONER ST. HELENS  
Many New Vessels of This Type Are Now  
Under Construction on the Pacific Coast  
For the Lumber Carrying Trade

which will be available within the next year or so.

At Seattle the Skinner & Eddy Corporation has laid the keels for two large modern steel freight steamers which have already been sold. It is reported that a second contract has been taken to build two freighters for Norwegian interests, together with two tankers for the Standard Oil Co.

The Puget Sound Bridge & Dredging Co., Seattle, has a contract from the Washington Shipping Corporation for four wooden lumber schooners, to be shipped with auxiliary power. These

vessels will be 242 feet in length, 43 feet beam and 21 feet deep, with a lumber carrying capacity of 1,600,000 feet board measure, or 2,500 tons deadweight. Each vessel will be equipped with Mietz & Weiss oil engines. Nilson & Kelez, Seattle, are building two auxiliary power schooners for R. M. Semmes and the Burkhardt interests of Portland, Ore. These vessels will engage in the general cargo trade in Alaskan waters.

The Seattle Construction & Dry Dock Co., Seattle, has a very full program on hand, including cargo steamers for the Ward Line of New York and a vessel for the Luckenbach interests, also of New York. J. F. Duthie & Co., Seattle, are building a double-ended motor ferry for bay service. The details of this vessel were described in the June issue of *The Marine Review*.

### Pacific Coast Active

Barbare Bros., Tacoma, Wash., are building a lumber schooner with a capacity of 1,500,000 feet board measure at Astoria, Ore. MacEcherson Bros., Astoria, Ore., are building three lumber vessels of the same size. Two similar vessels are also being built by Wilson Bros. at Astoria for the McCormick Lumber Co. Three more are under construction at the yards of the St. Helens Shipbuilding Co., St. Helens, Ore., for the same owners. The James Robertson Yard, Benecia, Cal., is building two 1,500,000 feet lumber schooners for Andrew Mahoney. The Hammond Lumber Co., Eureka, Cal., is building two 1,000,000-foot vessels for its own use. Frank Stone, Oakland, Cal., is constructing two 1,400,000-foot auxiliary schooners for J. R. Hanify and Sudden-Cristensen Co., Kruse & Banks, Marshfield, Ore., have two vessels under construction, including one of 1,500,000-foot capacity for the Byxbee-Clarke Co., and one of 1,200,000-foot capacity for the Charles Nelson Co.

Twelve modern auxiliary lumber schooners are being built at Aberdeen and Hoquiam, Wash., on Gray's harbor. Three vessels of 2,000,000-foot capacity are being built by Ward & Schubach for Swayne & Hoyt. The Peterson

Yards have four vessels under way, including two for Wilson Bros. & Co., and one each for the Byxbee-Clarke Co. and Balfour, Guthrie & Co. The Mathews Ship Yards are building five vessels, including three for the E. K. Wood Co., one for the Hart-Wood Lumber Co., and a fifth for the Freeman Steamship Co. The latter vessel will be named DAISY MATHEWS. She will be 220 feet long, 42½ feet beam and 15 feet deep. The schooner under construction for the Hart-Wood Lumber Co. will be named HARTWOOD and will be 250 feet in length. The three vessels under construction on Gray's harbor for Swayne & Hoyt will each be 290 feet in length, and 48 feet beam, making them the largest single deck wooden vessels under the American flag.

On the Columbia river, the Willamette Iron & Steel Works, Portland, expects to build four modern steel freighters at a cost of about \$1,000,000 each. These vessels will be equipped with 2,500 horsepower Curtis geared turbines. Each steamer will be 425 feet long and 54 feet beam, with a deadweight carrying capacity of 8,000 tons.

### Good Advice

In a recent issue of the monthly *Bulletin of the Lake Carriers' Association*, the following wholesome advice was addressed to the new man on shipboard:

You are about to enter a most important service. We are going to do our part to make your work pleasant by housing you well, feeding you well and paying you well. We hope you will like your job for what we want are stickers and not quitters. If you are the man we are after and we believe you are—you will naturally look forward to recognition and advancement. We are on the lookout all the time for men that we can promote. It is entirely up to you as to whether you are that kind. You will be judged solely on your record. No one can make your record except yourself. The positions open to you aboard ship are good ones. There are few better jobs than being master of a steamboat on the Great Lakes. There is a master's license in the kit of every deckhand. Every captain was once a deckhand. Remember that and see whether you can make as much out of yourself as he has made out of himself. We hope you can.

If you think it over it is a very foolish thing to take a chance of getting hurt. Money isn't going to compensate you for a permanent injury such as the loss of a leg or an arm or a finger. A permanent injury keeps lockstep with you through life. It handicaps you every day that you live. Bear in mind that it is you that gets hurt by not observing the rules—it isn't the master,

the mate or any of the officers of this Association—it's *you*.

Don't handle a wooden hatch without a hatch club. If you do you may fall into the hold. Nobody falls into the cargo hold twice. Don't walk on hatches. Always look out for open hatches and give them a wide berth.

Don't walk on the side of ship next to dock. You are liable to trip over a mooring line or get knocked in the head by falling ore or coal. Ore is hefty and a small piece can hand you quite a punch.

### Buys Dry Docks

The announcement that a syndicate has gained control of the Tietjen &

Lang Dry Dock Co., Hoboken, N. J., is taken by shipping men to mean that an extension of the company's present equipment is intended. According to the official statement issued by Berton, Griscom & Co., and Palmer & Co., the property will be managed by William H. Todd, chairman of the board. The company had operated under the presidency of Frederick C. Lang for many years.

Any addition to the present facilities of the dry dock company would be in line with the general development of New York as a ship repair center. The closing of German and British yards to the ships of neutrals has shifted the greater part of the repair work to American yards.

## American Ship Yards Lead

INFORMATION furnished by the department of commerce shows that during the first three months of 1916 American shipyards took a lead over British yards. American builders launched 173 merchant vessels of 94,464 gross tons, and British yards, according to Lloyds statistics launched 69 vessels of 80,561. Ships now building or under contract in American shipyards approximate in tonnage the contracted output of the British builders. This remarkable condition, which has not existed for many years, is due to the fact that American shipbuilders are working under an unusual demand and that government interference greatly restricts the output of British yards.

The figures compiled by the bureau of navigation show that on May 1, 1916, 368 merchant ships of 1,029,014 gross tons were under contract. On July 1, 1915, contracts were in effect for the construction of 76 ships of 310,089 gross tons. The remarkable increase of over 700,000 gross tons, coupled with a loss of about 165,000 tons in British shipbuilding, accounts for the present favorable status of the American industry.

The following table shows the rapid growth of American shipbuilding activity since July 1, 1915:

Date:	Seaboard.		Gt. Lakes and western rivers.	
	No.	Tons.	No.	Tons.
July 1, 1915...	62	294,138	14	15,951
Dec. 1, 1915...	143	644,150	59	117,361
Feb. 1, 1916...	163	759,208	67	142,163
Mar. 1, 1916...	164	766,649	80	179,149
Apr. 1, 1916...	176	823,651	184	244,205
May 1, 1916...	221	954,584	147	174,430

This unusual record is reflected in the resumption of business in yards that have been inactive for years, and in the organization of new companies.

Shipbuilding at Brunswick, Ga., has begun with the organization of the Brunswick Shipbuilding Co., with a total capital stock of \$50,000. A week

after the company was formed, the keel of the first ship was laid. The vessel is to be a three-masted sailing craft, 190 feet over all, 36.6 feet wide, 14 feet deep, to cost about \$35,000. Other vessels will probably be started soon.

There has been some inquiry at St. Johns, Newfoundland, respecting the construction of wooden vessels to supply the demand that has arisen for ocean tonnage. It is reported as probable that some of the old wooden shipyards that have been inactive for more than a quarter of a century may shortly be placed in operation again. Such a revival would be in line with the generally increasing activity of Canadian yards.

Italian interests have ordered a five-masted schooner, with a capacity of 1,500,000 feet of timber, from a Texas builder. The vessel will be built at Orange, Tex., and will be constructed of Southern pine, being the first large ship to be built of this material.

Portland is to have a modern shipbuilding plant at Linton. The plants of the Columbia Engineering Works and the Smith & Watson Iron Works will be utilized in the work, in which officials of both companies are interested. The yard, with the additional equipment required, is expected to have a value of \$1,000,000.

Portland and Eastern financiers have joined with F. C. Knapp, president of the Peninsular Lumber Co., for the establishment of a wooden shipbuilding plant near the foot of McKenna avenue on property adjoining that of the lumber corporation on the south.

Auxiliary wooden schooners are to be turned out, intended for the lumber trade, capable of carrying from 1,000,000 to 2,000,000 feet. Some of the vessels will be smaller than others, and all now planned will be built for sale.



## Maintaining Deck Watches

One of the most important things in ship operation, and one which is the least observed in lake practice, is that of maintaining deck watches in port. No one is admitted to the industrial plants without a reason and no one leaves his house door unlocked; yet there are many ships which maintain no supervision over the ladders at the ship's side. This is a very unwise practice, which should be remedied at once, it is stated in a recent issue of the *Bulletin* of the Lake Carriers' Association. The following circular on this subject was sent to the members by President Livingstone, on April 13:

"It is of the greatest importance to see that the deck watches of vessels are strictly maintained in port. The reason for this precaution is obvious. Ladders at the ship's side should be under the supervision of the deck watch constantly, so that any man, other than a member of the crew, seen climbing aboard may be at once required to state his business. No stranger should be allowed to board the vessel without permission from the officer of the ship. This is the invariable practice in shipping everywhere. In all parts of the world gangways and ladders are always kept under guard to prevent persons from coming aboard without proper authority and this should be the practice on the lakes."

## Book Review

*The Heritage of Tyre*, by William Brown Meloney; 180 pages, 4x7 inches; bound in cloth; published by The MacMillan Co., New York, and furnished by *The Marine Review* for 50 cents net.

This little volume embodies a collection of articles on American shipping by William Brown Meloney which have recently appeared in *The Saturday Evening Post*. The material has been rearranged and a large amount of it has been rewritten. The matter is interestingly presented and the author's knowledge of shipping problems insures his conclusions being sound. This volume would make a worth while addition to any maritime library.

## Railroad Ownership

The results of an investigation of connections between rail and water carriers and of the effect upon transcontinental freight rates of Panama Canal competition were recently submitted to the senate by the interstate commerce commission. The information was called for in a resolution passed by the senate on May 16, 1914, and the figures were as of June 30 of that year.

Reports of 337 carriers—170 railroads and 167 water carriers—were submitted

in the report. They showed that 121 railroads were interested in 86 carriers by water through intercorporate relationship and interlocking directorates or officers. Of the total 69 were interested in water carriers through interlocking directorates and officers only, and 52 through intercorporate relationship.

There were 1,098 vessels on June 30, 1914, of a gross tonnage of 2,941,941, of which 770 were steam vessels and 328, with a gross tonnage of 226,000, were sailing vessels and barges engaged in coastwise and foreign trade in which railroad companies were interested directly or indirectly.

Twenty-seven railroad systems or their subsidiaries, according to the report, owned or operated steamship lines or vessels. The total number of vessels



JAMES C. ECKLIFF

operated by the 27 carriers was 648 of a gross tonnage of 1,030,214, of which 498 vessels with a gross tonnage of 596,225 operated on the Atlantic and Gulf coasts, 71 with a gross tonnage of 234,499 on the Pacific coast and 69 of a gross tonnage of 199,490 on the Great Lakes.

In the time covered by the commission's report vessels were operating actively through the Panama Canal, furnishing real competition with the railroads. Soon afterward the great slide in the canal blocked traffic entirely for many months, and it has been resumed only on a comparatively small scale.

A river steamer has just been launched at Shanghai, which has been built entirely by Chinese, the only exceptions being the water-tube boilers and draft fan.

## James C. Eckliff

James Carlton Eckliff, 29 years old, president and manager of the Eckliff Automatic Boiler Circulator Co., Detroit, died of typhoid fever on Tuesday, May 9, at his home in Detroit. Mr. Eckliff was born in Detroit on June 27, 1887, and was educated in the Detroit schools. He was married in 1909 to Miss Hazel Lyon. For several years he was in the steel business, representing the Vulcan Crucible Steel Co. Since its organization in 1911, he had been associated with the Eckliff Automatic Boiler Circulator Co., to whose success he contributed largely. This company specializes on the manufacture of circulators especially adapted to Scotch marine boilers. In addition to the main office in Detroit, branch offices are maintained in New York and Philadelphia. It is announced that the death of Mr. Eckliff, while severely felt, will not interfere in any way with the plans of the organization with which he was connected.

Mr. Eckliff was a member of the American Society of Naval Engineers, of the Engineers' Club of Philadelphia and of numerous other fraternal and social organizations. He is survived by a widow, his parents and two brothers.

## List of Aids

A list of all lighted aids to navigation maintained under the authority of the United States Lighthouse Service and the Dominion of Canada on the Great Lakes, the St. Lawrence river above St. Regis river, and on lakes Memphremagog and Champlain, has been issued by the United States Lighthouse Service. It includes light-houses, lighted beacons, light vessels, lighted buoys and fog signals, but not unlighted beacons or buoys. This list is corrected up to April 1, 1916. A copy may be obtained free by any pilot or shipmaster upon application to the division of publications department of commerce, Washington.

## New Ship Yard for Canada

A site 400 x 1,100 feet has been secured by Boyd's Ltd. at Port Moody, B. C., for a \$200,000 ship-building plant. There are to be three launching slips with facilities for erecting two ships on each simultaneously. The slips will be located in such a manner as to provide for the construction of steel vessels up to 10,000 tons. The plant will comprise a steel foundry, machine shop and wood working plant, and two railways will be provided.

# Auxiliary Schooner to Carry Lumber

Wooden Motor Ship City of Portland is a New Type of Lumber Carrier Designed, Built and Owned on the Pacific Coast

By Kenneth McAlpin

THE shortage in tonnage created by the European war seriously restricted the activities of the lumber trade of the Pacific northwest. The only relief possible was the construction of new vessels and the problem simmered down to a selection of one of the four types of lumber carriers. *The Marine Review* of April, 1909, contained a careful and complete analysis of the Pacific lumber carrying trade. Three types of vessels handled the bulk of the traffic at that time. These types were sailing schooners with

she will draw 22 feet 8 inches. The Bureau Veritas and the San Francisco Board of Marine Underwriters has given the ship the classification of A1 for 11 years. The keel was laid September 3, 1915, and she was launched six months later. The launching of CITY OF PORTLAND is shown in the accompanying illustration.

Looking forward from the after end one is impressed by the amount of stowage room secured through the truss type of construction. A heavy fore and aft timber and steel truss extends

from the floor timbers to the deck beams. With few exceptions, the vessel is built completely of Douglas fir. About 1,500,000 feet of lumber was used in the construction and more than 200 tons of galvanized fastenings.

The northwest has long been noted for its wonderful ship timbers and the masts for CITY OF PORTLAND are notable examples of Douglas fir. The foremast, which is the tallest, is 130 feet long, 30 inches thick at the butt, swelling slightly above the base. The largest masts are the three center ones, they being about



LAUNCHING THE WORLD'S LARGEST WOODEN AUXILIARY CARGO CARRIER. A SISTER SHIP IS SHOWN ON THE WAYS AT THE EXTREME RIGHT

a capacity of 1,000,000 feet board measure, wooden steam schooners with a capacity of 1,000,000 feet board measure, and steel steam schooners with a capacity of 1,500,000 feet board measure.

In its efforts to relieve the present ship shortage, the Charles R. McCormick Co., San Francisco, one of the largest export and coastwise lumber companies on the west coast, discarded these three standard types and decided to build a wooden schooner equipped with a low cost auxiliary engine. CITY OF PORTLAND was built as a result of this decision. Her launching holds a peculiar interest to American ship builders for she is the largest wooden auxiliary cargo carrier in the world. She is 278 feet long, 48.3 feet beam, 22 feet molded depth. Her gross tonnage is 1,791 and her net tonnage 1,649. When carrying 2,000,000 feet of lumber, board measure,

from stem to stern and from the keelson to the single deck, thus re-inforcing the hull without interfering with the handling and stowage of the lumber. A steel bulkhead divides the cargo hold from the engine room and further strengthens the vessel.

Some of the longest timbers ever used in vessel construction make up a part of her hull. These are in lengths of from 60 to 145 feet, ranging in size from 8 x 12 inches to 36 x 36 inches. From the top of the keelson timbers to the bottom of the keel is an even 8 feet of timber, mostly 20 x 24-inch sizes. A section from the inside to the outside of the vessel, through a frame, has an average thickness of 2 feet. The planks range from 4.5 x 14 to 6 x 8 inches. The hanging knees are through bolted underdeck timbers and at regular intervals, stanchions extend

the same height as the foremast, but 40 inches thick at the butt. The fifth mast is about the same size. All booms, gaffs and cargo booms are Douglas fir. The bowsprit is one piece of timber more than 50 feet long, tapering from a square butt of 30 inches to 10 inches at the outer end.

An uncommon feature of this boat which probably is not seen in another vessel of her size, is a slot in the butt end of the mast. This slot is needed to allow the masts to pass over the re-inforcing truss. The slot is 14 inches wide and extends from the keelson to the deck beam. All masts, spars and booms, were shaped and finished in the yards of the St. Helens Ship Building Co., St. Helens, Ore.

CITY OF PORTLAND has a deep well deck which will accommodate slightly more than 1,000,000 feet of lumber.

Slightly less than 1,000,000 feet can be stowed in her hold.

The sailors quarters are, of course, in the forecabin peak. The quarters of the captain and officers as well as the dining saloon and galley, are in the extreme after portion of the vessel. They are surmounted by an 8 x 12-foot enclosed wheel house. The captain's quarters consist of bedroom, living room and bath. On the other side of the main dining saloon are the quarters of three officers and the chief engineer with a bathroom between. The galley is situated so as to serve the main dining saloon and the sailors' mess with the greatest convenience.

CITY OF PORTLAND will carry a 7,000 square yard spread of canvas, giving her an estimated sailing speed of 9 miles an hour. The auxiliary power plant comprises two four-cylinder Bolinders type semi-diesel engines. Each unit will develop 320 horsepower at 225 revolutions per minute. They actuate a four-blade propeller, 77 inches in diameter, with a pitch of 61 inches. These engines will have an estimated consumption of 26 barrels in 24 hours. They will drive the ship from 7.5 to 8 miles per hour. The trip from the Columbia river to Sydney, Australia, will only require approximately 28 days. These engines will occupy only 4 per cent of the cargo space. The engines were furnished by the Bolinders Co., 30 Church street, New York.

The power equipment occupies the after end of the vessel. At the extreme end are two fresh water tanks with a total capacity of 10,000 gallons. The fuel tanks are arranged alongside the engines and will contain 1,200 barrels of fuel oil, which gives the vessel a cruising radius of 6,000 miles. In addition to the propelling engines CITY OF PORTLAND will have one 66-inch marine boiler for driving the steam anchor hoist, steam capstan, four double hoist winches, steam bilge pump and the electric dynamo when in port.

For loading and stowing lumber or other cargo, two pair of cargo booms

are provided. One pair is on the foremast and serves an 18 x 26-foot hatch. The second pair is on the spanker mast and serves a similar-sized hatch forward of this mast. This arrangement enables the vessel to be unloaded from either or both sides at one time, each boom being driven by a separate double winch for which steam is furnished by the donkey boiler. Only four days, it is estimated, will be consumed in loading a capacity cargo of 2,000,000 feet.

CITY OF PORTLAND is a bald head schooner. Her engines will only be used to drive her into the wind. She will leave shortly for Australia with a capacity cargo of lumber. The vessel has been chartered ahead for three trips at high rates. On the return trip,

## Issues Bulletin

The United States engineers, war department, have issued a new bulletin, No. 25, containing survey data of the northern and northwestern lakes. This bulletin, which contains 494 8 x 10-inch pages, gives a complete revision of surveys of the Great Lakes made by the United States engineers and others, and published in previous bulletins. The matter has been edited and its publication supervised by O. C. Hattery, United States lake survey office, Detroit. In addition to complete survey data covering each of the Great Lakes and their connecting rivers, the bulletin includes extracts from the laws of the United States relating to navigation, a list of wireless telegraph, coast guard and storm warning display stations, together with a list of signals for the opening of draw bridges, and tables for the conversion of compass points to azimuth.

## New Firm

The firm of F. H. Osborn & Co., insurance brokers and average adjusters, Chicago, was dissolved on June 1. Its business was taken over by T. L. Osborn & Co., a firm recently organized by Theodore L. Osborn, a former member of the old firm. F. H. Osborn has entered the firm of F. Herr-

mann & Co., marine underwriters, New York, and C. R. Osborn also has become associated with the latter firm.

Records are being made by sailing vessels on the trans-Pacific routes which indicate that the day of fast passages for this type of ship does not belong wholly to the past. Among recent performances have been that of the small schooner BERTIE MINOR, which made the run from Guam to San Francisco in 36 days, or almost three weeks better than the average passage; that of the barkentine JAMES JOHNSON running between San Francisco and Sidney in 58 days; and the schooner GOLDEN SHORE, arriving at Grays Harbor from Wanganui, New Zealand, in 51 days.

## The United States and the Seven Seas

**"FOREIGN** shipowners collect from American people \$245,000,000 annually; such a sum would build in an American ship yard 250 large ocean vessels, and it equals 80 per cent of the custom duties collected last year on all imports to the United States," says a well-known American shipping man.

"Consider the European trade into American seaports. There came from Europe during the fiscal year of 1912, 3,896 ships, with an aggregate of 16,223,926 net tons. Of this great fleet only 54 carried the Stars and Stripes.

"Import: For the fiscal year 1912, only 11 per cent; back in the '70s over 30 per cent were American-carried.

"Export: For 1912 only 8.1 of our water-borne export trade was carried in American bottoms; following the Civil War, as high as 39.2. Are we to continue to go backward?

"In connection with South American trade let us look at the shipping statistics of Buenos Ayres, one of the world's largest ports. In 1913 a total of 2,593 vessels entered the port; of these 1,325 were English, 80 Norwegian, 57 Dutch, 225 German, 202 Argentine, 183 Italian, 159 French, 138 Uruguayan, 57 Austrian, 47 Spanish, 27 Brazilian, 25 Swedish, 24 Belgian, 15 Greek, 13 Danish, six Russian, two Chilean and two American.

"A great deal of unreliable prophecy has been made in regard to the effect of the Panama canal on our trade, but from the mass of conjecture stands out clearly the fact that the geographical and commercial center of the world has been changed to our Atlantic coast by the placing of our ports, New York, Boston, Philadelphia, Baltimore and others, 3,000 miles nearer to Hong Kong, Shanghai, Melbourne and other rich export centers than is either London or Hamburg."

she will carry to Portland, Ore., 3,000 tons of coal or general cargo. She will be in charge of Captain Olaf Jonson.

CITY OF PORTLAND, as well as three sister ships was designed and built under the direction of J. H. Price, naval architect. The three sister ships are now on the ways at the yard of the St. Helens Ship Building Co. These vessels are CITY OF ST. HELENS, CITY OF ASTORIA and CITY OF EUREKA. At Astoria, Ore., two steam schooners are being built for the Charles R. McCormick Co. CITY OF PORTLAND will cost approximately \$175,000.

The Pan-American Petroleum & Transport Co. has placed an order with the Union Iron Works of San Francisco for two tank steamers to cost \$2,750,000.

# On the Coasts, Lakes and Rivers

What's Doing and Who's Doing It

## Busy on the Columbia River

By Kenneth McAlpin

SHIP BUILDING continues to be the chief source of interest in the Columbia river district and the two latest new companies to take the initial step of incorporating are the Peninsula Ship Building Co., which was recently incorporated with a capital of \$200,000, and the Motorship Construction Co., of Vancouver, Wash., which entered articles of incorporation at Olympia, Wash., with a capital of \$75,000.

The latter firm has contracts for four auxiliary motor schooners, involving a total cost of \$548,000, and options are in force for three additional schooners of a similar type. E. P. Schock, of New York, who designed the vessels, is to be supervising architect for the ship yard. He has provided standardized models and the four vessels, although not for the same owners, will be built at the same time. Delivery will be made in eight and ten months. The vessels will be 250 feet long, 44-foot beam and 22 feet deep, and will have twin screws driven by two 320-horsepower Bolinder semi-diesel engines. In connection with the contracts, the company is offered a bonus for early completion and the plant will be operated under the profit-sharing system for the employees.

At the site of the Peninsula Ship Building Co., one of the Portland dredges is now making a fill which will enable work on the first of the two wooden steamers to be started. Provision is being made for the building of three more of the same type. The plant will be located next to the plant of the Peninsula Lumber Co.

At the plant of the Northwest Steel Co., Portland, work is progressing rapidly and the fill is almost completed for the site of the permanent ways. Contracts have been let for the mold loft and machine shops, which will be completed at an early date. Bills of lading have been received for the first shipment of steel for the first of the four vessels to be built by this firm in conjunction with the Willamette Iron & Steel Co., and it is estimated that 4,000 tons of steel will be required for each vessel. The fourth vessel has been sold by the firm of Hannevig & Johnson, New York, contracting brokers, to Willy Gilbert, Bergen, Norway and will be named after him. Each ship will cost approximately \$1,000,000. All will be built from the same patterns and will be of 8,800 tons capacity, 423 feet long, 54 feet wide, with a molded depth of 29 feet 9 inches. Each will be driven by Curtis geared turbines of 2,500 horsepower. The boilers and auxiliary equipment will be built by the Willamette Iron & Steel Co. The first two vessels have been sold to Lauratz Klost-

ter, Stonenga, Norway, and are to be named LAURATZ KLOSTER and ELLEN KLOSTER. The third vessel has been sold to Peder Kleppe, Bergen, Norway, and will be named after him.

The Willamette Iron & Steel Co. has at the present writing 21 marine boilers under way, including sets of three each for the steamers MAUD LAMONT and MARY EDDY, now being built in Seattle, and 12 boilers to be installed in the four steel ships being built in conjunction with the Northwest Steel Co. The boilers for the two former vessels are the largest of the Scotch marine type, built in this city. Each boiler is designed for a working pressure of 210 pounds.

The Eagle Lumber Co., of which Daniel Kern, of the Columbia Contract Co., is the head, recently closed a contract with the Alaska railroad commission for 6,000,000 feet of fir lumber. The company has secured six barges, formerly used in the Columbia river jetty rock delivery, and has converted them into seagoing barges to deliver the lumber. The tugs SAMPSON and H. J. BIDDLE are being used to tow the barges and the former recently left with the first barge and a load of approximately 600,000 feet of lumber. It is expected that these barges will find further cargoes after the completion of this contract.

In connection with the Alaska trade, a local company has been formed to buy the steamer CAPE COD, now on the Atlantic coast, and to place her in freight service between Portland and Alaska. The steamer NORTHLAND, formerly running between this port and the south, has been chartered at from \$350 to \$375 per day in freight service from Seattle to Alaska.

Waterfront organizations are asking for higher wages. The Marine Engineers' Beneficial Association passed resolutions calling for an increase in wages and made a new schedule for all vessels to which their wage scale applies. The request is not for a general increase, but a rearrangement of the schedule so as to apply the advance to individual vessels. The committee had the benefit of the advice of Charles Follett, secretary of the executive committee, with headquarters in Washington, D. C., and his views with regard to the situation on the Atlantic coast entered into the decision to ask for an advance.

Charter rates continue high for vessels loading at north Pacific ports. Recent charters call for 1917 loading. The schooner W. H. MARSTON was chartered to J. J. Moore Co., of San

Francisco, for loading at north Pacific ports, March and April, 1917, at a rate of 110s for Sydney delivery and 122s 6d, for Melbourne. It was rechartered for a second voyage November and December, 1917, at the rate of 100s for Sydney and 112s 6d for Melbourne. MARSTON has a capacity of 400,000 feet of lumber. All rates for coastwise shipping for the west coast have taken a jump, the latest being a 5 per cent increase on lumber from Grays Harbor to San Pedro, making the rate now \$7. Freight rates on all vessels from California to Oregon points have taken a jump and the vessels have been leaving cargo on every trip.

The British bark CALGATE has been sunk by a submarine. This vessel was dispatched from Portland on Jan. 4, to the Azores. Her cargo consisted of 161,218 bushels of barley valued at \$135,425 and was fully insured.

The California & Oregon Lumber Co., with headquarters at Brookings, Ore., has let a contract to the St. Helens Ship Building Co., for a wooden steam schooner, to be driven by Bolinder semi-diesel engines. It will be 180 feet long, 43-foot beam, 16 feet deep. It will handle lumber in units of 3,000 feet each, necessitating a new cargo rig.

## On the Chesapeake

By Hollis F. Bennett

THE steamship CHARLES F. MAYER, together with the steel barge No. 27, have been sold by the Consolidation Coastwise Co. to the Wittenberg Coal Co. of New York. The CHARLES F. MAYER was built 32 years ago by the Harlans & Hollingsworth Corporation at Wilmington, Del. It is 236 feet long and of 1,213 tons gross register. Barge No. 27 was built by the New York Ship Building Co. in Camden, N. J. It is about 10 years old.

The CHARLES F. MAYER will load sugar in New York and will come to this port to pick up the barge which will load grain. Both cargoes are destined for a French or British port. Chief engineer John Cain of the CHARLES F. MAYER, leaves the ship after 28 years of continuous service. The barge has been named POILU.

On May 9, 26 ships arrived at the port of Baltimore, making 86 loading or awaiting berths. Practically every nation except those of the German alliance are represented. The unexpected arrival of these vessels at one time practically swamped the Maryland pilots association. Pilots arriving on steamers were placed on tugs and sent down the bay again to meet other incoming



steamers after they had entered the capes. In one case three ships came up the bay with but one pilot, and two rear ships following the ship which had the pilot on board. Due to the strict censorship abroad, departures for this port are seldom reported and this fact, coupled with the good weather of the last two weeks is probably responsible for the unexpected arrivals.

The Coastwise Ship Building Co. has been organized in this city for the construction of wooden schooners, barges, lighters and scows. The new company has secured from the McLean Contracting Co. a site at the foot of Andre street, fronting on the Spring Gardens branch of the Patapsco river. The site was formerly occupied by the Sagax Mfg. Co. and is improved with wharves and brick buildings. Work has been

started in equipping the shops and in building shipways. The company proposes to specialize in oil burning auxiliaries and has already secured several contracts.

The Baltimore & Carolina Steamship Co. has placed a contract for a wooden freight steamship 200 feet long, 38-foot beam and 22-foot depth, with the M. M. Davis Co., Solomons Island, Md. The company also has a steel freighter under construction at the Harlans & Hollingsworth yard at Wilmington, Del. The former is the first large steam vessel to be constructed of wood in this vicinity since the civil war.

The wooden U. S. coast guard cutter *TIOGA* was launched at the yards of M. Mitchell Davis & Sons, Solomon Island, Md., on May 3. The *TIOGA* was

christened by Miss Savilla Gamble, the daughter of the commander of the cutter *APACHE*. The *TIOGA* is 80 feet long and is to be used in boarding service of the customs at this port.

The Argentine bark *LA ARGENTINA*, Capt. Riis, arrived on May 9 with the largest cargo of linseed ever received at this port. The cargo approximated 2,800 tons and is consigned to the Robert Ramsay Co.

The Maryland Steel Co. has turned the new steamship *MUNSOMO* over to her owners, the Munson Steamship Co. The *MUNSOMO* will load general cargo at Baltimore for points on the island of Cuba. The *MUNSOMO* is 345 feet long, has 45-foot beam, and is 30 feet deep. It has a deadweight capacity of 5,000 tons.

## Boston Bay is a Lively Place

By George S. Hudson

EDMUND Billings, collector at Boston, has been ordered by William C. Redfield, secretary of commerce, to have division inspectors report any violation of the seamen's law, all vessels coming under the regulations to be inspected before leaving port. A dearth of sailors is hampering shipping now that the yachting season is in full swing, men going to the easier berths on pleasure craft at an increase in wages over that paid by the merchant marine. Scarcity of longshoremen at the transatlantic terminals has shattered many schedules and has caused piers to become congested with merchandise. By working overtime some of the longshoremen have pocketed as high as \$40 per week, the regular scale being 35 cents per hour and 40 cents overtime. On account of heavy movement of munitions and for other reasons the railroads have given that class of freight preference over grain and, in consequence, several elevators could not be worked to capacity early this month. A number of freighters that came to Boston for cargoes of grain for delivery to the French and Italian governments were held from 10 days to two weeks, the delay mounting to above \$10,000 in case of the British tramp *THESEUS*. Coastwise business during May was unusually heavy and ships frequently were off schedule because it was impossible to handle cargo expeditiously at the Boston end. At least a dozen strikes where longshoremen demanded increased wages occurred last month, all being settled speedily by granting the demands outright or by compromise.

The first cargo of grain ever shipped from Boston to Savona, Italy, went forward in the British steamship *ZOROASTER*, Capt. Hartley, the consignment consisting of 348,066 bushels of oats for the Italian government.

The British motor ship *BOSTONIAN*, built by the Leyland line for the Boston-London service to replace a ship of the same name worn out in service, has been sold to the Glen Line of London, and her name has been changed to *GLENGYLE*.

Forty dollars per 1,000 is the rate on 350,000 feet of lumber to be carried

from Boston to Buenos Ayres by the 3-masted schooner *DAMIETTA* and *JOANNA*, owned by the Shepard-Morse Lumber Co. Prior to the war, when tonnage was plentiful, a rate of \$8 was considered excellent by owners of sailing ships and barks who controlled the trade almost exclusively.

The Boston fishing schooner *A. PIATT ANDREW*, Capt. Wallace Bruce, engaged in trawling for haddock, stocked \$35,268 between Sept. 17 and the opening of the summer season, the crew sharing \$656 each. This is said to be an exceptionally high stock as the winter fishing was interrupted by long spells of boisterous weather.

The Boston-owned steamship *BYLAVL*, engaged in the coal trade between Chesapeake Bay and New England ports since going into commission less than a year ago, is now employed between Buenos Ayres and Boston as a general freighter.

In connection with development of Boston harbor the dredge *PITTSBURG* has been towed from New York to remove about 1,000,000 feet of material between East Boston and Governor's Island.

Highest rates ever known are being paid on log wood from Hayti, the 4-masted schooner *MALCOLM BAXTER JR.*, Capt. Moore, having been chartered at \$19 per ton to transport 2,000 tons.

J. A. Anderson, of Boston, has been appointed agent of a projected steamship line between Petrograd, Helsingfors, Boston and New York. Capital in Helsingfors, Finland, is largely interested in the line which will be started at end of the war. Three 10,000-ton ships with passenger and freight accommodations have been secured.

The Massachusetts nautical schoolship *RANGER*, Capt. P. W. Hourigan, left Boston May 26 on a cruise to the West Indies and Atlantic coast of the United States, and will return to Boston Sept. 14. The *RANGER* has on board 104 cadets and was inspected prior to leaving by Governor McCall and staff.

The three-masted schooner *GRACIE D. CHAMBERS*, recently used as a barge in the coal trade, has sailed from Boston for Liverpool with a cargo of about 400,000 feet of lumber, the rate being \$40 per 1,000. She has been chartered at \$40.25 to carry a similar cargo from Gaspe, P. Q.

A new tank steamer, the *CUBADIST*, built by the Fore River Ship Building Corporation for a Cuban molasses concern, left Boston a few days ago on her maiden voyage to Cuba. The ship has capacity for about 1,500,000 gallons of molasses and is commanded by Capt. Van Gilder, formerly master of the company's tank steamer *CURRIER*.

### Around Puget Sound

By F. K. Haskell

WITH a value of \$13,660,144, Tacoma's ocean commerce for April led the other ports of the district of Washington by a margin of more than \$3,480,000. Exports amounted to \$12,158,049, and the imports were valued at \$1,502,095.

When the Chicago, Milwaukee & St. Paul railroad completes the \$500,000 improvement on the tide flats, the company's ocean terminals at Tacoma will represent an expenditure of \$2,000,000. Since the road established its terminals in Tacoma seven years ago, \$1,500,000 has been spent in the building of its docks.

By the time the British steamer *KING MALCOLM*, which recently crossed the Columbia river bar bound for the United Kingdom, reaches her destination, her gross earnings during the seven months she has been absent from her home port will have reached \$700,000. This is twice the cost of the vessel.

The Puget Sound Waterfront Employers' Association has sent telegrams to Washington asking the departments of labor and commerce to intervene in the situation that has grown out of the demand by the longshoremen for higher wages. The longshoremen have refused to enter into conference with the employers and say they will stand by their original demands and will strike if the



demands are not met. This would result in a strike that would affect the entire Pacific coast. The employers have now appealed to the departments of commerce and labor because the conciliators of that department last year brought about the adoption of the present scale because they allege the new scale is so high it threatens to destroy the commerce of Puget Sound.

In the present demands, say the longshoremen officials, the executive committee of the association has no power to arbitrate or enter into any conference whatsoever with the employers association. The wage demands were fixed by the members at a recent convention, and at that time it was voted that the strike would be called unless the demand was met. The employers say the wage scale asked is out of all reason and they point out they are not reaping huge profits in the present shipping activity, but that the high rates for ships give the profits to the steamship owners.

Captain Louis Lane's 300-ton wooden schooner *GREAT BEAR*, built at Port Blakeley, Wash., will start north June 10. She will carry 32 men and four whale boats, and with her sheathing to resist ice will be perhaps the strongest boat for her size ever built in the United States. John Borden, millionaire sportsman, of Chicago, who is a partner of Captain Lane, in the *GREAT BEAR*, will go to Alaska on the boat.

With a cargo that includes a large number of Christmas boxes for stations on the Bering Sea and Arctic Ocean, and lumber and supplies, the schooner *C. S. HOLMES*, Captain John Backland, has departed for the north. Backland is now entering on his tenth season in the Arctic. Aside from being an Arctic trader and navigator, Captain Backland also acts as "sky pilot" in the remote Arctic communities. He is equally at home in the pulpit or on the quarter-deck.

Because coal is about \$18 a ton in Honolulu and about \$4 a ton in Seattle, the steamship *J. L. LUCKENBACH*, bound from New York to Taku bar, China, with a 3,000-ton cargo of case oil, traveled more than 2,000 miles out of her course to coal at the bunkers of the Pacific Coal Co. The *LUCKENBACH* arrived in Seattle during the past week on the last lap of a 15,000-mile journey, having but 5,500 more miles to steam. Steamers from eastern ports in the past have coaled in the Philippines, but prices recently have been prohibitively high and the situation is proving to the advantage of Seattle. The cargo of the *LUCKENBACH* consists of fine petroleum sent out by the Standard Oil Co. for the Chinese trade. Captain E. H. Read reported a smooth and uneventful voyage.

The *LUCKENBACH* has an interesting history. She was built as the German steamer *SAALE*, and in a fire at Hoboken, N. J., she was badly burned. The *J. L. Luckenbach Co.* took her over and practically rebuilt her. She has been in Seattle on numerous occasions, and for a while in 1911 was used in the Nome, Alaska, trade. She is 322.7 feet long, 39.9 feet wide, with a depth of 22 feet and a net tonnage of 3,192.

The \$100,000 power schooner built by Barbare Bros., ship builders of Tacoma,

Wash., is in demand among charterers before she is half completed. Her owners have been offered rates exceeding 120 shillings for the vessel's service in voyages to Africa and England, and even part of the charter money would be paid in advance if desired.

The vessel is a 4-masted schooner, 202 feet long, with a beam of 42.9 feet

and depth of 15 feet. She will have a net tonnage of 800 and a lumber capacity of 1,200,000 feet. There will be a twin-screw engine of 400-horsepower. The schooner will be launched Aug. 1. Barbare Bros. designed the vessel, and are contemplating the construction of another soon after this one is off the ways.

## Up and Down the Lakes

By A. A. Eiben

REPORTS from Buffalo indicate that a new record for handling grain from the opening of the navigation season to June 1 was established by the elevators of that port, 46,100,000 bushels having been handled from April 27 to June 1. This is an increase of about 8,000,000 bushels over the previous high mark during the last 30 years. As an instance of the wonderful dispatch in the grain trade obtaining at Buffalo, it is stated that the steamer *LEWISTON* unloaded 104,000 bushels during nine hours, arriving at 6:30 p. m. on May 31 and clearing port at 3:30 a. m. June 1.

The steamer *PERE MARQUETTE V.*, belonging to the fleet of the *Pere Marquette Line Steamers*, Manistee, Mich., was recently sold to a company in Sidney, Nova Scotia, for service on the Bay of Fundy. *PERE MARQUETTE V.* was built at West Bay City in 1890, and is 226 feet long, 38 feet beam and 24 feet deep. She has accommodations for 200 first class passengers, in addition to other passenger capacity, and has a gross tonnage of 1,722.

The *Dakota Transit Co.* was recently incorporated at Duluth with a capital stock of \$50,000. The incorporators are H. H. Dinham, H. A. Carmichael and L. M. Norton.

The steamer *CORSICA*, owned by the *Corsica Transit Co., Hutchinson & Co., Cleveland*, managers, has been sold to the *Coastwise Transportation Co., Boston*, for approximately \$140,000. The steamer was built at the *Globe ship yard, Cleveland*, in 1888 and is 299 feet long, 40 feet beam and 21 feet deep, with a gross tonnage of 2,364. She will be cut in two at the *Buffalo yard of the American Ship Building Co.* in order to make the trip to the coast through the canal.

*Osborn & Co., successors to F. H. Osborn & Co., marine insurance brokers, Chicago*, announce that *Andrew G. Lange*, for many years connected with *Johnson & Higgins and Prindiville & Co., in the lake marine insurance business at Cleveland and Chicago*, has become associated with *Osborn & Co.*

The steamer *EASTLAND* is at the *South Chicago yard of the American Ship Building Co.*, where she is being repaired and fitted out for use as a naval training ship.

The steamer *GAUTE*, building at *Detroit*, and the steamer *SIGRID FISTENOS*, building at *South Chicago*, were launched

recently. These vessels are building for Norwegian interests.

The steamer *W. P. SNYDER JR.*, owned by the *Shenango Steamship & Transportation Co., Cleveland*, recently loaded 12,667 tons of ore at *Duluth* which she delivered at *Conneaut*. This is the largest ore cargo ever brought to a *Lake Erie* port. A record was also established by the *SNYDER JR.* in 1915, when she carried 12,622 tons of ore from *Duluth* to *Cleveland*.

Capt. M. F. Morgan, of *Chicago*, has been appointed grand secretary of the *Ship Masters' Association* to fill the vacancy created by the death of Capt. W. D. Hamilton.

*Joseph Coria*, superintendent of the *Soo ore dock at Ashland*, will have reached the age limit prescribed by his employers at the end of the present season and will retire on a pension. Mr. Coria has been in charge of the *Soo dock* since it was built and has been connected with the ore trade for 46 years.

At a reorganization meeting of the *Postal Steamship Co., Detroit*, the following officers were elected: *John J. Barlum*, president, treasurer and general manager; *George B. Greening*, secretary; *Lewis T. Barlum*, assistant treasurer. The directors include the foregoing with *J. R. Lee* and *Thomas J. Barlum*.

An additional steamer has been placed in commission by the *Detroit & Cleveland Navigation Co.* on the route between *Detroit and Cleveland*, to take care of the increasing freight and passenger traffic.

The steamer *HENRY G. DALTON* of the *Interlake Steamship Co.'s fleet*, left the *Lorain ship yard* on *May 20*, on her maiden trip. The steamer was taken out by *Capt. L. W. Stone*, of *Vermilion* and went to *Toledo* for a cargo of coal.

The old schooners *W. D. HOSSACK*, *BOYCE* and *QUICKSTEP* left the *Great Lakes district* recently, having been sold to parties in *Mobile, Ala.*

The new 12,000-ton steamer building for the *Franklin Steamship Co.* at the *Lorain yard of the American Ship Building Co.*, will be named in honor of *Emory L. Ford* of *Detroit*. The vessel will be launched during *July* and will go into commission in *September*.

# Equipment Used Afloat and Ashore

## Direct Current Generating Set—Electric Tachometer

**A** DIRECT-CURRENT generating set for marine or stationary service is shown in the accompanying illustration. It is especially adapted for lighting or power service in small plants. The set consists of an American Blower Co. single or double cylinder, automatic steam engine, and a direct-current generator, made by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., direct-connected to the engine shaft. For lighting or power service the standard voltages are 125 to 250. For this service the generators having the compound field windings so proportioned that the same voltage is obtained at full load and no load. For special systems where 125 volts are required



DIRECT-CURRENT GENERATING SET

for lighting and 250 volts for power, the larger sized generators are supplied for three wire service. These three wire generators will take care of any unbalancing of the two sides of the system up to 10 per cent of full load.

The set is simple to operate and is said to require little attention. The generator is of forged steel construction. The commutating poles and large bearings are protected from dust. The generator has automatic oil-ring lubrication. It is strongly built but is light in weight. The operating temperature is low.

The generator is mounted on the same base as the engine. The engine has automatic lubrication by pump and gravity, with a large cooling, settling and filtering area.

Robert Haig who has been chief supervisor of Lloyds inspection bureau in the east for a number of years, with

headquarters in the Bourse, Philadelphia, has resigned to become connected in a leading capacity with the Sun Shipbuilding Co., which is building a large shipyard at Chester, Pa.

### Electric Tachometer

The accompanying illustration shows an electrical tachometer outfit built for a United States naval vessel by the Electric Tachometer Co., 722 Perry building, Philadelphia. This instrument consists of a combination of a direct-current magneto generator connected in series to one or more indicating millivoltmeters of the D'Arsonval type. The connection is made by means of a suitably insulated twin-cable conductor. It is a well known fact that when a system of coils is rotated within a magnetic field of permanent strength, a potential is generated directly proportional to the number of magnetic lines cut per unit of time; in other words, proportional to the revolutions per minute of the rotating coil. This is the underlying principle of the Hopkins electric tachometer.

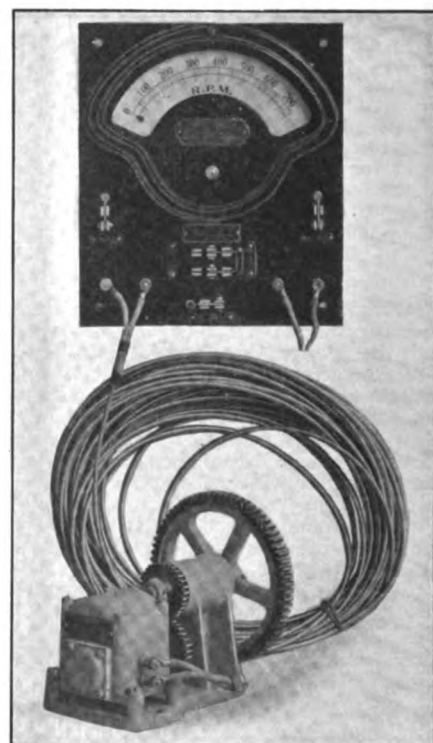
The greatest advantage claimed for this instrument, aside from its accuracy, lies in the fact that the indicating device may be placed at any distance from the source of energy. The magneto generator may be driven by means of gearing, as in the case of the outfit illustrated herewith, or with a belt, chain, or direct connection to the driving shaft. The choice of drive depends mainly on the conditions of space and speed.

The indicating instruments are made according to the specifications of the leading electrical instrument manufacturers of the United States. All indicators are provided with external zero adjusters by means of which slight discrepancies due to changes in the hair springs may be corrected.

### Releasing Gear

James R. Raymond, 8 Bridge street, New York City, has issued a 28-page pamphlet describing the Raymond releasing device for life boats. Among other advantages, it is claimed that the fin on the back of the Raymond hook prevents the shackle from passing back or upwards far enough to allow it to fall in behind the bill of the hook while detaching or attaching. This fin also aids in starting the shackle to fall. The shackles are made to conform to the shape of the hook when seated, thus making the boat more secure when hanging in the

davits. This arrangement also prevents the possibility of the boat twisting off the hooks when swinging. It is not necessary to mouse the hooks except while carrying the boat outboard in a rolling sea. By the use of the lanyards rove in the bills of the hooks, it is said the boat can be hooked on with certainty in the darkest night or the roughest sea without injury to the fingers. This avoids delay and danger of the boat being smashed alongside by failure to hook on quickly. The falls may be rove

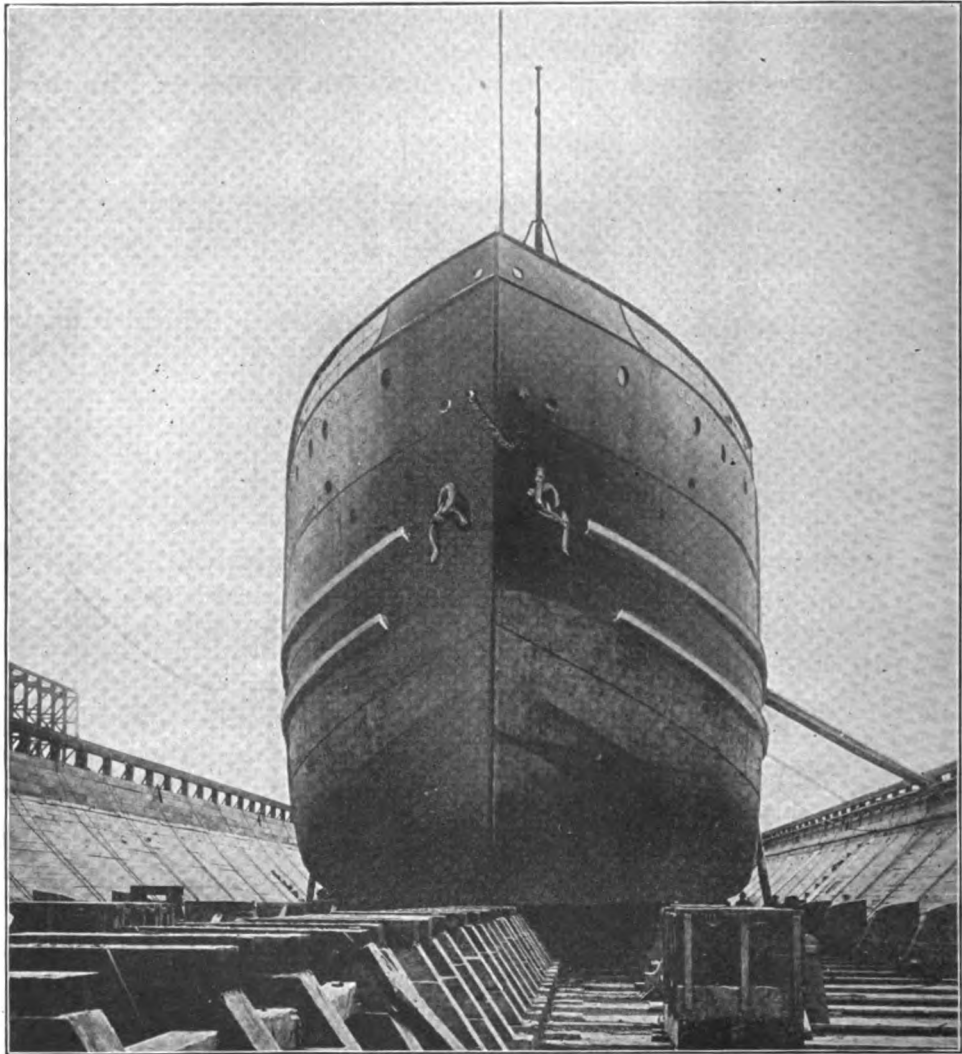


ELECTRIC TACHOMETER

so that both ends of the boat will detach no matter which end strikes the water first.

The American Smelting & Refining Co. has acquired ownership of three vessels, two of which will sail under the American flag between the United States and Chile and the third between this country and Europe. The boats are REPUBLIC, SHERMAN and POTOMAC, with a combined gross tonnage of 19,800 tons. The price paid for each vessel was about \$700,000, according to the New York Tribune. REPUBLIC was salvaged in the harbor of Papeete, Tahiti, one of the Society Islands, after having been sunk by its French owners to save it from being totally destroyed by a German commerce raider.

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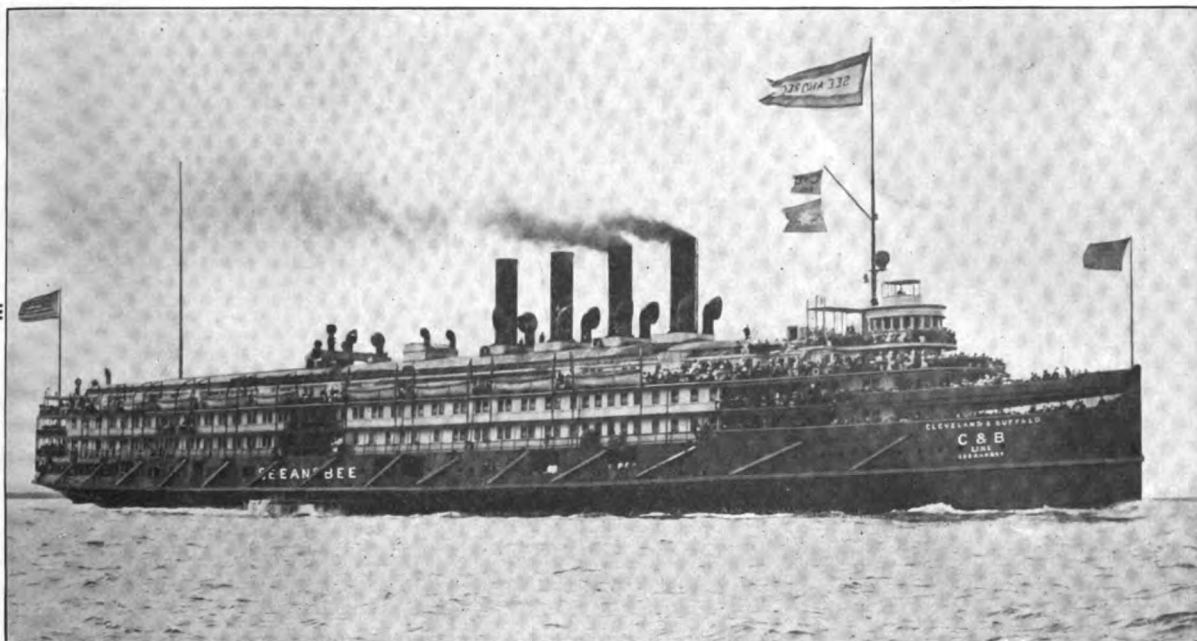
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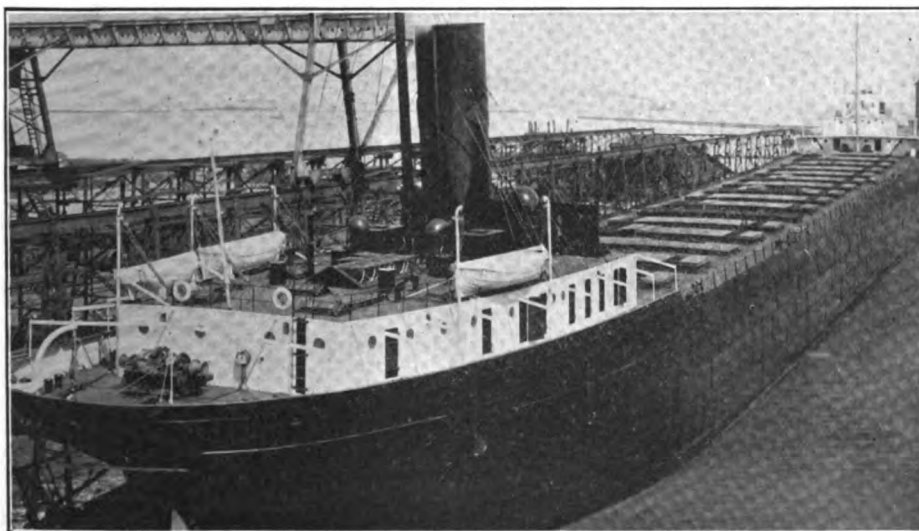
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Experience has proved that this system gives increased strength, increased cubic and deadweight capacity, reduced cost of maintenance, and reduced vibration at no greater first cost than a vessel of similar dimensions built on the transverse system.

Owners who are contemplating the construction of new vessels, of any type whatever, will find this system of construction most advantageous and suitable for all trades.

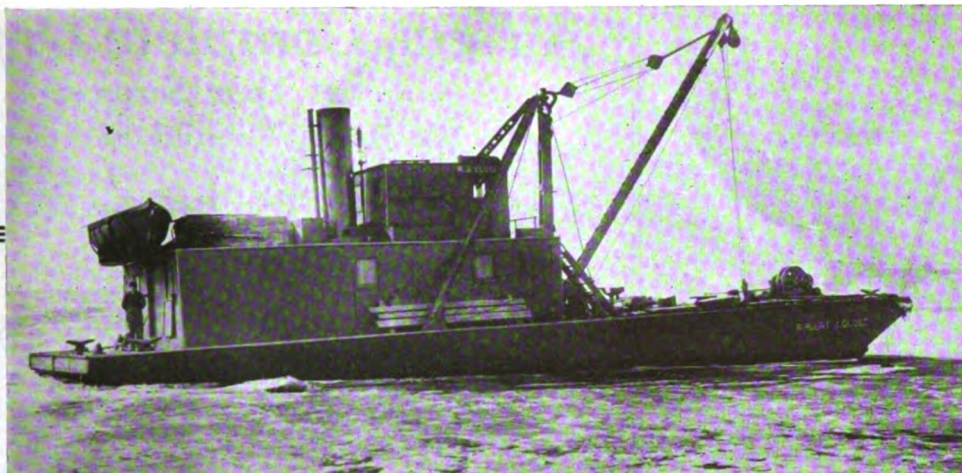
514 vessels of all types and sizes, representing about 3,932,000 tons deadweight carrying capacity have been built or are now on order, including a good many repeat orders from Owners who have tried the system.

**J. W. ISHERWOOD,  
4, Lloyd's Avenue,  
LONDON, E. C.**

**Tel. Address:  
“ISHERCON, LONDON.”**

*Please mention THE MARINE REVIEW when writing to Advertisers*





**MARINE REPAIR STEAMER "ROBERT J. CLOSE"**

Equipped With  
 Electric Welding Machine—Gas Welding Machine—Air Compressors—Electric Forges—Electric  
 Lathes—Electric Drilling Machine—Electric Grinding Machine—Electric Punch and Shears—  
 Electric Bolt and Pipe Machine—10-Ton Derrick

At Your Service Day or Night      ::      ::      Boiler Repairs Our Specialty

**THE SUPERIOR SHIP BUILDING CO.**

SUPERIOR, WISCONSIN

Builders and Repairers of Ships of all types for  
 GREAT LAKES and SALT WATER SERVICE.

**②—DRYDOCKS—②**

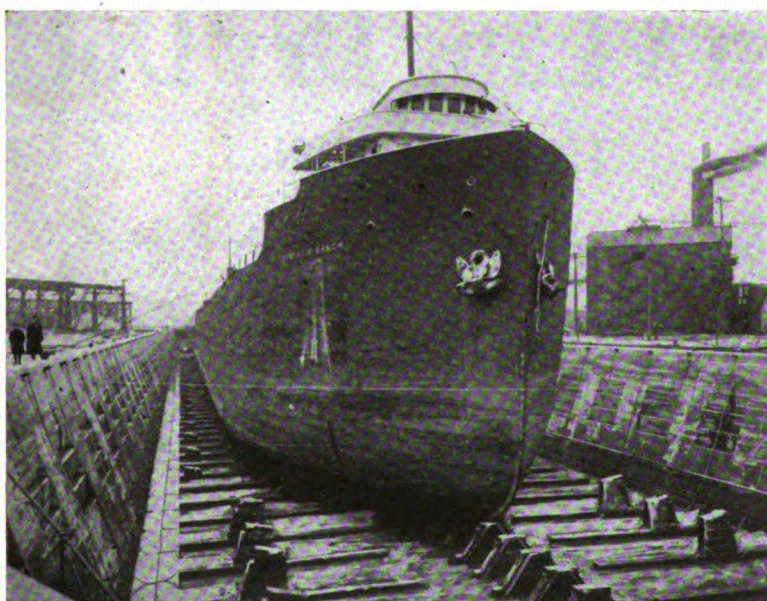
**Chicago Ship Building Company**

CHICAGO, ILLINOIS

We Build  
 Steel Ships

Passenger  
 or  
 Freight

Any Size



Dimensions of  
 Dry Dock

	Feet
Length -	734
Width:	
At Top -	103
At Bottom -	88
Depth -	22½

Steamer George F. Baker in Our New Concrete Dock at South Chicago

**We Operate the Largest Graving Dock on Lake Michigan**  
**Complete Facilities for Rapid Repair Work**

Shops and Dry Dock at South Chicago

*Please mention THE MARINE REVIEW when writing to Advertisers*



Ours is not the ordinary kind of dry dock. **One** of the distinct advantages that we have over others is the **marine railway**, which is 500 feet in length. This railway allows us to haul out craft and move them around so that we can take advantage of our 5 acres of property, thus giving us an immense capacity. We employ a force of 75 men who have at their disposal every modern convenience, including a complete mill for getting out material; a large up-to-the-minute, electric derrick; a great number of electric drills, etc. One of the boats on which we are now working, is the fuel lighter, Wm. G. Perry, owned by the Pittsburg Coal Co., length 175 feet; beam 34 feet.

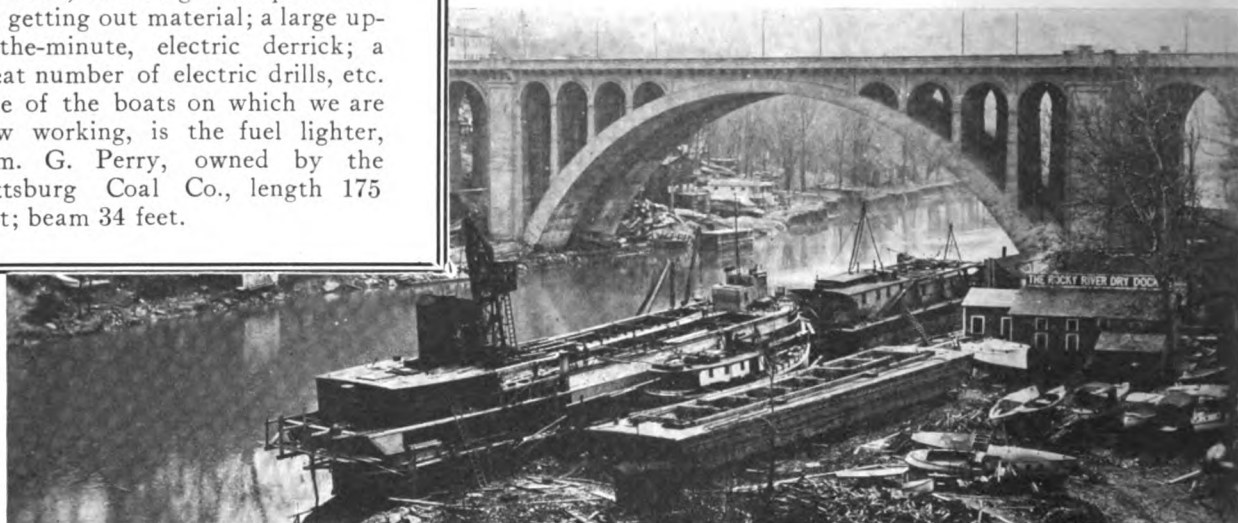
## A New, Complete Dry Dock at Your Service!

**We Build, Rebuild and Repair**  
anything that floats, up to 200 feet in length, and with  
draft not exceeding 12 feet.

We specialize  
Large and small **Vessels, Tugs, Power Boats and  
Yachts.**

Put your proposition up to us and you will not be  
disappointed.

**ROCKY RIVER DRY DOCK COMPANY**  
ROCKY RIVER - - - OHIO



# Tietjen & Lang Dry Dock Co.

HOBOKEN, N. J.

**NINE  
DRY DOCKS**

**General Repairs on Wooden and Iron Vessels**

**FT. OF 17th STREET**

**Telephone 700 Hoboken**

**HOBOKEN, N. J.**

*Please mention THE MARINE REVIEW when writing to Advertisers*



## The Buffalo Dry Dock Company

### BUFFALO, N. Y.

With our excellent equipment we are enabled to do all kinds of ship repairs at reasonable cost to the owners, whose patronage is solicited with the guarantee of satisfaction in all particulars.

**EDWARD N. SMITH, Superintendent**

**WILLIAM KNIGHT, Ass't Sec'y and Treas.**

Office Telephone, Bell, 4055 Seneca: Federal, 22-531

Superintendent's Telephone, Tupper 3012

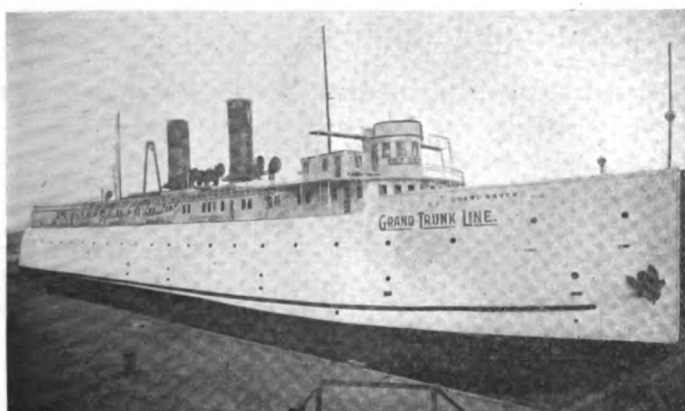
Ass't Sec'y's Telephone, 324 North

## Milwaukee Dry Dock Company

Milwaukee, Wisconsin

### Ship Repairs of All Kinds

Also Machine Shop for Engine Repairs



Car Ferry "Grand Haven" in Dry Dock

We have two ship yards offering every facility for the repair of both steel and wooden vessels. South Yard Dock is 450 feet long on keel blocks; 460 feet over all; 60 feet width of gate and 16 feet over sill. West Yard Dock is 312 feet on keel blocks; 45 feet width of gate and 12 feet over sill. Rudder pit in each dock. Electric light for night work.

Residence Phone  
**F. W. Smith, Manager**  
Lake 467

**Main Office at South Yard**  
Foot of Washington Street

Telephone—Hanover 3  
West Yard—Hanover 2555

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# LARGEST FLOATING DRY DOCK EQUIPMENT ON THE PACIFIC COAST

Completely Equipped Shops for Ship, Engine and Boiler

## REPAIRS

Ship Builders, Engine Builders, Boiler Makers, Iron Founders, Brass Founders, Lumber Manufacturers

PARSONS' MARINE STEAM TURBINES—YARROW BOILERS

Cable Address: "THREEDOCKS"—Codes: Western Union, A. B. C., 5th ed. and Bentley's

**Seattle Construction & Dry Dock Company**  
SEATTLE, WASHINGTON

## BATH IRON WORKS

LIMITED

BATH, MAINE

### Shipbuilders and Engineers

Licensee for  
Parson's Marine Turbines,  
Normand Express Water Tube Boilers.

Particular Attention Given to  
High Speed Requirements  
Estimates Furnished.

### PROVABLE FACTS—

IF you want to experiment—you won't be interested in the WAGER PATENT IMPROVED FURNACE BRIDGE WALL. BUT if you want a bridge wall that has in it five years of making good; a bridge wall that is turning the marine industry away from the antiquated fire brick; one that insures less smoke, minimum upkeep, greater efficiency and backed up by responsible references including all the leading railroad, freight and passenger steamer companies, private yacht owners, stationary plants and others—you WILL be interested in the WAGER BRIDGE.

This isn't argument, or persuasion, or contention. It's just simple, provable facts. May we prove these facts to you?

**ROBERT H. WAGER**

FURNACE BRIDGE WALLS

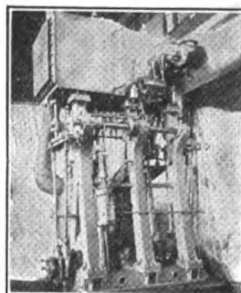
New York

Philadelphia

Detroit

New York Office: Singer Building

Telephone: Cortlandt 4299



**STEEL SHIPS  
ENGINES  
MARINE BOILERS**

**Manitowoc Shipbuilding & Dry Dock Co.**  
MANITOWOC, WIS.

Please mention THE MARINE REVIEW when writing to Advertisers



# OUR DRY DOCKS SAVE TIME

Two Docks, coupled with Complete Shop Facilities, cut repair periods to a minimum

Length on Keel Blocks, feet  
Width of Dock Floor, feet  
Draft Over Sill at Low Water

Upper Dock	Lower Dock
600	437
62	50
22½	22½

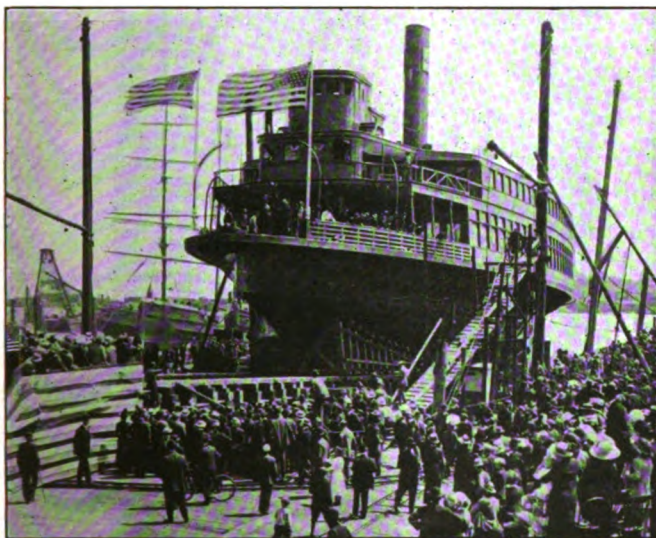
## A COMPLETE SHIP BUILDING PLANT

Our new building slips take vessels up to 325 feet long, 50 feet beam and 32 feet deep. Our yard is specially laid out for rapid construction. We also have auxiliary building slips for small craft.

**Baltimore Dry Docks and  
Shipbuilding Company**

BALTIMORE, MD.

CABLE ADDRESS—BALTDOCKS, U. S. A.

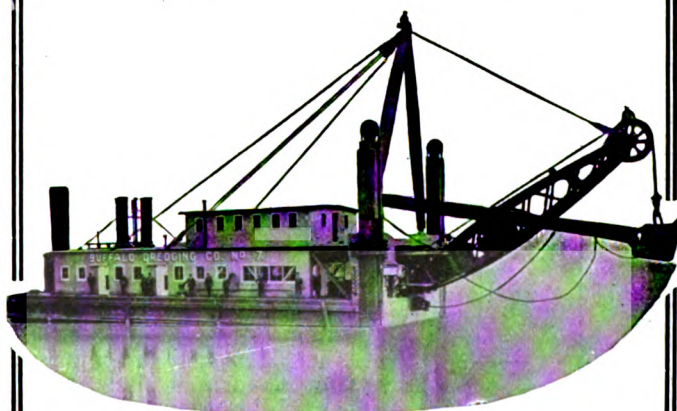


**Moore and Scott  
Iron Works**

Engineers and Ship Builders

SAN FRANCISCO, CAL.

**MODERN MARINE BOILERS  
and  
STEEL SHIP BUILDING**



**TUGS, PASSENGER STEAMERS  
and SPECIAL CONSTRUCTION**

WRITE

**JOHNSTON BROTHERS**

FERRYSBURG, MICHIGAN

Please mention THE MARINE REVIEW when writing to Advertisers



# NOTICE!

## Draft of all Vessels passing through Lake St. Clair Restricted to 19'-9"

WAR DEPARTMENT  
UNITED STATES ENGINEER OFFICE  
ROOM 337 FEDERAL BUILDING  
DETROIT, MICH.

May 29, 1916.

THE MARINE REVIEW,  
Cleveland, Ohio.

Gentlemen:-

1. Referring to your letter of the 26th inst., you are correct in your understanding that steps are being taken to lessen the liability of stranding in the channel in Lake St. Clair by restricting the load draft of vessels destined for Lake Erie Ports.
2. Investigation showed that there had been considerable shoaling in Lake St. Clair, particularly just below the St. Clair Flats Canal. Dredging is in progress at present to remove this shoaling and very satisfactory progress is being made. The worst of the shoaling has been already removed, the dredging having been carried over about one mile below the lower end of the west, or downbound canal.
3. It is still believed to be unsafe for vessels to traverse Lake St. Clair when drawing more than 19' 9" and the load draft of such vessels is restricted accordingly.
4. In view of the fact that on the run from the Soo to Lake St. Clair the fuel consumption will somewhat lessen the load draft, as observed at the Soo, by the time the vessel reaches the St. Clair Flats Canal, instructions have been issued to detain at the Soo any vessel which is loaded to more than 19' 11". Vessels upbound will likewise be loaded so that when crossing Lake St. Clair they will not draw more than 19' 9".
5. The above restrictions upon the vessel draft are solely with a view to promoting safety and to preventing the serious results which might follow a stranding in the Lake St. Clair channel particularly at this time when everything must be done to reduce to a minimum the delays which boats experience. It is hoped that all vessel owners and vessel masters will co-operate in the effort to prevent such delays. The restrictions upon the load draft will be enforced.

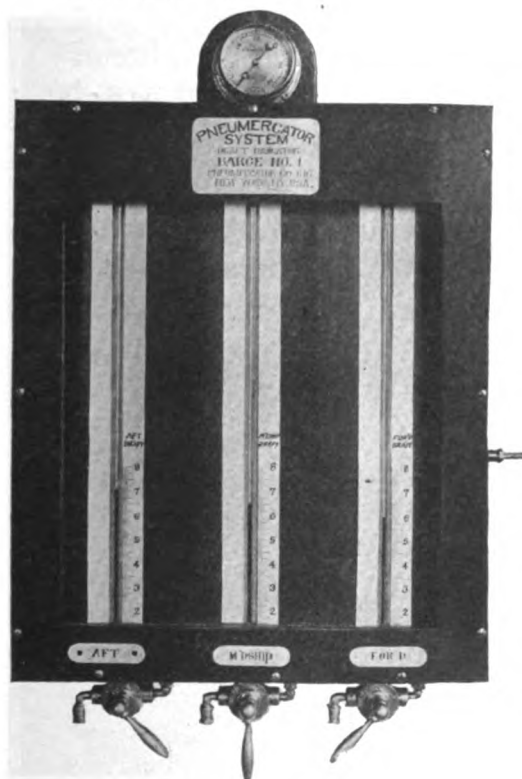
Very respectfully,

*Maxwell Patrick*  
Colonel, Corps of Engineers.

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# VESSEL OWNERS OF THE GREAT LAKES

Why do you continue to take chances when a Model D-I Special PNEUMERCATOR, installed in the pilot house, gives the Captain accurate knowledge of his REAL DRAFT and TRIM DAY AND NIGHT.



With this instrument there is absolutely no excuse for overloading, while at the same time the full cargo capacity, at any predetermined draft, is assured.

Forward, Midships and Aft Drafts indicated day and night regardless of weather conditions.

This instrument can be installed while the vessel is on her regular run.

A PNEUMERCATOR INSTALLATION IS JUST AS IMPORTANT AS YOUR INSURANCE POLICY.

## PNEUMERCATOR COMPANY, INC.

118 Liberty Street  
NEW YORK

or

Orlando Sumner,  
4 Bedford Chambers;  
London, Eng.

George E. Lawrence,  
Bullitt Building,  
Philadelphia, Pa.

Alexander Hynd,  
Rockefeller Bldg.,  
Cleveland, O.

J. C. H. Ferguson,  
Monadnock Bldg.,  
San Francisco, Cal.

F. J. French,  
2250 Brainard Street,  
New Orleans, La.

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# National Defense and International Peace



## What the Engineers are Doing



THIRTY thousand American engineers are making a card index survey of American industry so that it may be prepared for its vital part in defending the country, if need comes. The past eighteen months have taught us here in America what lack of industrial preparedness has meant to some of the countries now at war. These nations had the ships and they had the men; but when the hour struck, their factories were not able to furnish the colors with arms and shells and powder. Their factories were not prepared. And our factories are not prepared.

But it is not enough to draw a moral. In the United States five great Engineering Societies—Civil, Mining, Mechanical, Electrical and Chemical—have pledged their services to the Government of the United States, and are already working hand in hand with the Government to prepare industry for the national defense. They receive no pay and will accept no pay. All they seek is opportunity to serve their country, that she may have her industries mobilized for defense.

All elements of the nation's life—the manufacturers, the business men, and the workingmen—should support this patriotic and democratic work of the engineers, and assist them cheerfully when asked. *There can be no better national insurance against war.*

The Associated Advertising Clubs of the World, representing all advertising interests, have offered their free and hearty service to the President of the United States, in close co-operation with these five Engineering Societies, to the end that the country may know what the engineers are doing. The President has accepted the offer. The engineers have welcomed the co-operation.

This advertisement, published without cost to the United States, is the first in a nation-wide series to call the country to the duty of co-operating promptly and fully with the engineers.

### NAVAL CONSULTING BOARD OF THE UNITED STATES

IN CO-OPERATION WITH

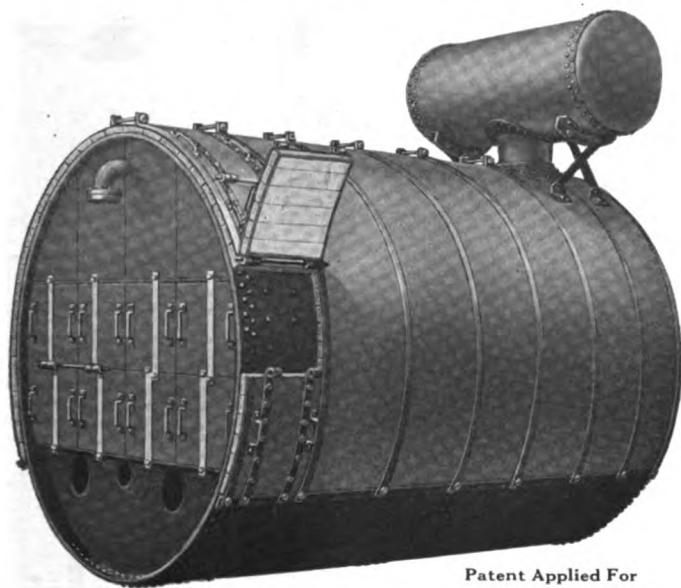
The American Society of Civil Engineers      The American Society of Mechanical Engineers  
The American Institute of Mining Engineers      The American Institute of Electrical Engineers  
The American Chemical Society

ENGINEERING SOCIETIES BUILDING

29 WEST 39th STREET, NEW YORK

Please mention THE MARINE REVIEW when writing to Advertisers

# CLOSED BUT ACCESSIBLE



## A Boiler Covering in Panels

Just lift a panel and fix your stay bolts—or slip off a single strap and see the entire section.

Universally adaptable and absolutely practical for boilers old or new.

*Prices and complete description gladly furnished.*

Patent Applied For

## THE CAREY COMPANY

ASBESTOS SPECIALISTS

Cleveland, Ohio

## BYERLYTE DECK FLOORING

The only successful composition flooring for ships



Diningroom of the Steamer Underwood of the Erie Railroad Lake Line covered with Byerlyte

Vessel owners are recognizing the wonderful adaptability of Byerlyte deck flooring for ships. It absolutely will not crack; it binds perfectly with either wood or steel; it is waterproof, fireproof and vermin-proof; it is entirely mineral, is indestructible and will wear forever.

*Vibration cannot break its surface*

**BYERLEY & SONS**  
CLEVELAND

Estimates given on request

*Please mention THE MARINE REVIEW when writing to Advertisers*



# WATERBURY CORDAGE



## For All Marine Uses In All Standard Grades

Years of experience in rope making insures the very highest quality in respective grades.

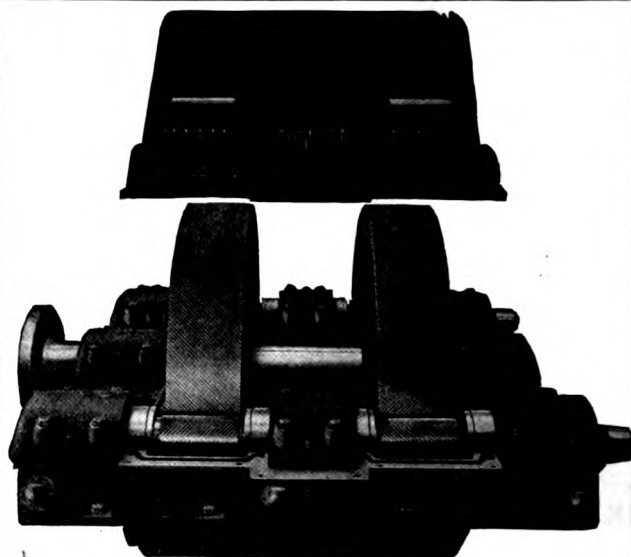
Write to our nearest office for prices and deliveries on Waterbury Cordage. Also Waterbury "Green Strand," "Armored" and "Fibreclad" Wire Rope.



## WATERBURY COMPANY

63 PARK ROW, NEW YORK

CHICAGO.....419 W. 12th Place  
DALLAS, TEX., Powell & Ellet Co., 911 Southwestern Life Bldg.  
SAN FRANCISCO.....113 Davis St.  
NEW ORLEANS.....1018 Maison Blanche Bldg.



4500 H. P. De Laval Marine Reduction Gear

## Use DE LAVAL Geared Marine Steam Turbines

The double-helical speed-reducing gear for steam turbine service was first introduced by De Laval in 1894.

At present over 6500 De Laval Double-helical Speed-Reducing Gears are in successful operation.

De Laval Gears are built by highly skilled workmen from the best materials, and with equipment developed and improved by over 20 years of experience.

All factors entering into the design have been chosen after long experience under practical operating conditions, and all parts are made on a limit gage, interchangeable basis.

The De Laval Double-helical Speed-reducing Gear is not an ingenious idea based upon imperfectly developed theories, but an accomplished fact.

It is based upon the principle that a correctly cut gear, correctly mounted and protected from external distorting forces, will run smoothly and noiselessly and will not be subject to excessive wear or deterioration.

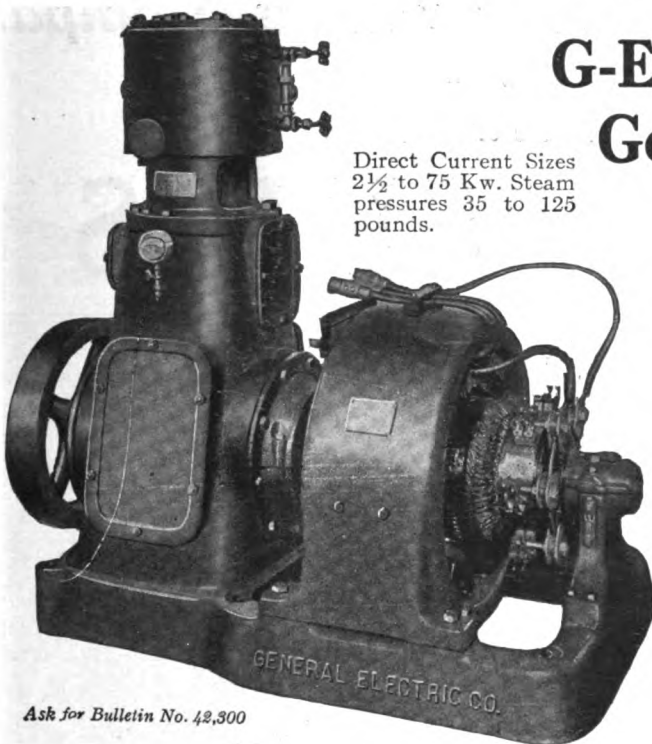
If interested in saving weight and fuel, and in the greater simplicity and lower first cost of geared turbines for ship propulsion, write us, giving particulars of the proposed boat so that we may supply full information.

We are prepared to furnish marine steam turbines and gears in any capacity and for any steam conditions.

## DE LAVAL Steam Turbine Co. TRENTON, N. J.

219

Please mention THE MARINE REVIEW when writing to Advertisers



Ask for Bulletin No. 42,300

## G-E Steam Engine Generating Sets

Direct Current Sizes  
2½ to 75 Kw. Steam  
pressures 35 to 125  
pounds.

are specified by shipowners and builders who want the guarantee of the General Electric Company on both the engine and the generator operating as a unit.

They are designed especially for marine work—which demands light, compact and durable sets of close regulation and quiet operation with a minimum of attention.

In addition to these units in sizes from 2½ to 75 Kw. this company manufactures a complete line of generators suitable for direct-connected operation.

## The Standard of Reliability

for electric power equipment on board ship, has been established and maintained for many years by the General Electric Company.

*Maximum reliability in the long run at sea is obtained by specifying the products distinguished by*



*this trade mark, the guarantee of excellence on goods electrical.*

## General Electric Company

Atlanta, Ga.  
Baltimore, Md.  
Boston, Mass.  
Buffalo, N. Y.  
Chicago, Ill.  
Cincinnati, Ohio  
Cleveland, Ohio

Duluth, Minn.  
Erie, Pa.  
Fort Wayne, Ind.  
Hartford, Conn.  
Jacksonville, Fla.  
Los Angeles, Cal.  
Milwaukee, Wis.

General Office: Schenectady, N. Y.

ADDRESS NEAREST OFFICE

Minneapolis, Minn.  
New Haven, Conn.



New Orleans, La.  
New York, N. Y.

Niagara Falls, N. Y. San Francisco, Cal.  
Philadelphia, Pa. Schenectady, N. Y.  
Pittsburgh, Pa. Seattle, Wash.  
Portland, Ore. Spokane, Wash.  
Providence, R. I. Springfield, Mass.  
Richmond, Va. Toledo, Ohio  
St. Louis, Mo. Washington, D. C.

For Michigan business refer to General Electric Company of Michigan, Detroit.  
For Texas, Oklahoma and Arizona business refer to Southwest General Electric Company (formerly Hobson Electric Co.), Dallas, El Paso, Houston and Oklahoma City. For Canadian business refer to Canadian General Electric Company, Ltd., Toronto, Ont.

5951

Please mention THE MARINE REVIEW when writing to Advertisers

M. E. FARR, President

O. J. FISH, Vice-President

A. G. SMITH, General Manager

# *The American Ship Building Company*

CLEVELAND, OHIO

*Builders of*

# STEEL SHIPS

*For***Lake, Ocean, Sound and River Service*****Marine and  
Stationary Engines******Boilers, Windlasses and  
Auxiliary Machinery***

Birdseye view of our new Cleveland plant, showing our two large dry docks

**¶** Special Facilities for the Construction of Ocean Going Steel Steamers, coupled with extensive experience assures satisfactory results on salt water work.

**We Operate Fast Dry Docks and Complete Plants at Cleveland and Lorain**

*Please mention THE MARINE REVIEW when writing to Advertisers*



## PINTSCH GAS LIGHTED BUOYS

Adopted by the English, German, French, Russian, Italian and United States Lighthouse Departments for Channel and Harbor Lighting. Over 2,200 Buoys and Gas Beacons in service.

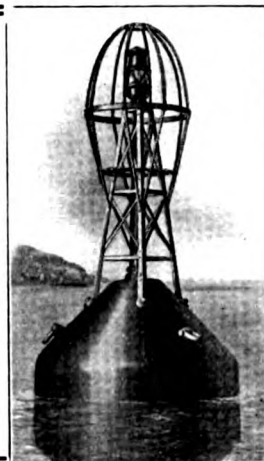
**Burn Continuously From Eighty to Three Hundred and Sixty-five Days and Can be Seen a Distance of Six Miles**

Controlled by

**SAFETY CAR HEATING & LIGHTING CO.**

2 RECTOR STREET, NEW YORK

Chicago Philadelphia St. Louis San Francisco, Cal. Boston Montreal



## MECHANICAL AND ELECTRICAL SHIPS TELEGRAPHS



Rudder Indicators

Shaft Speed Indicators

Electric Whistle Operators

Electric Lighting Equipments, Fixtures, Etc.

Electric and Mechanical Bells

Annunciators, Alarms, Etc.

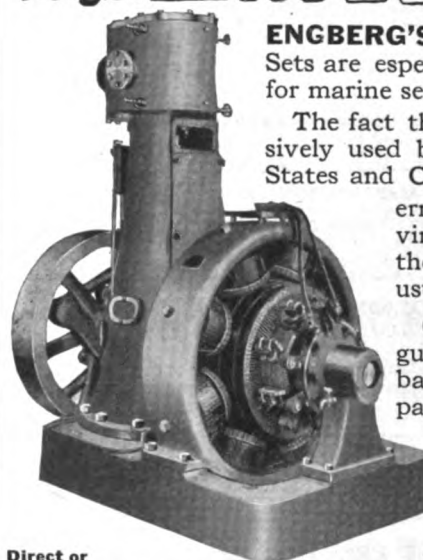
Loud Speaking Marine Telephones

Installations

**Chas. Cory & Son, Inc.**

290 HUDSON STREET, NEW YORK CITY

## ENGBERG DIRECT CONNECTED Dynamamos and Engines



**ENGBERG'S** Generating Sets are especially adapted for marine service.

The fact they are extensively used by the United States and Canadian Governments is convincing proof they possess unusual merit.

Our iron clad guarantee stands back of each apparatus.

Bulletins fully describing this equipment sent upon request.

Direct or Alternating Current—1 to 75 KW

Manufactured by

**ENGBERG'S  
ELECTRIC & MECHANICAL WORKS**  
6 Vine St. ST. JOSEPH, MICHIGAN

## This 25c Can of Polish for 6c!



**Better Results  
at  
Less Labor  
and  
Cost**

We wish to CONVINCE you, at the lowest possible cost to YOURSELF, that every bit of metal on your ship can be kept so clean and bright that it will prove a continual source of great pride.

The little coupon shown below, accompanied by 6c—postage stamps will do—will entitle you to a regular 25 CENT SIZE CAN of U. S. METAL POLISH.

U. S. Metal Polish cleans, polishes and preserves all kinds of metals, and works equally well on hot or cold surfaces.

It is absolutely non-inflammable and does not shrink or deteriorate in storage. It is guaranteed to keep in perfect condition year after year.

Don't Forget to Use the Coupon!

**Geo. Wm. Hoffman Company**  
559 E. Washington St. Indianapolis, Ind.

**Geo. Wm. Hoffman Company,**  
559 E. Washington St., Indianapolis, Ind.

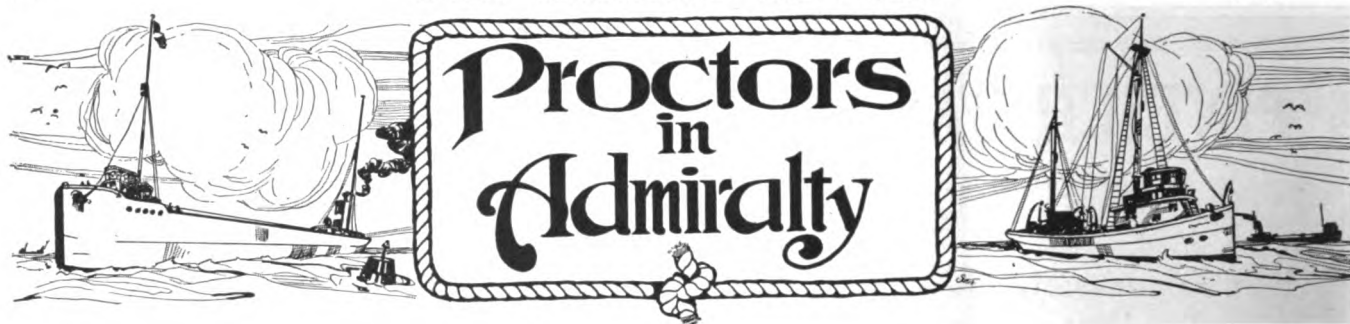
Gentlemen:—Enclosed you will find 6 cents in stamps or coin, for which send me one LARGE 25 CENT CAN OF U. S. METAL POLISH PASTE.

Name.....

Address.....

Please mention THE MARINE REVIEW when writing to Advertisers



**ALBERT J. GILCHRIST**

PROCTOR IN ADMIRALTY

Rockefeller Building

CLEVELAND, O.

**C. E. KREMER,**COUNSELOR AT LAW AND  
PROCTOR IN ADMIRALTYSuite 1012-1016 Insurance Exchange Building  
CHICAGO, ILL.**GOULDER, WHITE AND GARRY**

LAW OFFICES

Rockefeller Building

CLEVELAND, O.

Walter I. Lillie

Leo C. Lillie

Hugh E. Lillie

**LILLIE, LILLIE & LILLIE**  
LAWYERSProctors in Admiralty, General Practitioners  
and Commercial Collections

Business Address, GRAND HAVEN, MICHIGAN

S. H. HOLDING, F. S. MASTEN, T. H. DUNCAN and F. L. LECKIE

**HOLDING, MASTEN, DUNCAN  
& LECKIE**ATTORNEYS AT LAW AND  
PROCTORS IN ADMIRALTY

840-848 Rockefeller Building

CLEVELAND, O.

**Spencer & Spencer**

ATTORNEYS AT LAW

**PROCTORS IN ADMIRALTY**

Alworth Building, Duluth, Minn.

**HOYT, DUSTIN, KELLEY,  
McKEEHAN & ANDREWS,**

LAWYERS AND PROCTORS IN ADMIRALTY

Offices, 702 Western Reserve Bldg.,

CLEVELAND, O.

**WARREN, CADY, LADD & HILL**ATTORNEYS AT LAW AND PROCTORS  
IN ADMIRALTYCharles B. Warren  
William B. Cady  
Sanford W. Ladd  
Joseph G. Hamblen, Jr.  
Sherwin A. HillClaudius B. Grant, Counsel  
Union Trust Building, Detroit**John Wanamaker Says:**

Advertising doesn't jerk; it pulls. It begins very gently at first, but the pull is steady. It increases day by day and year by year, until it exerts an irresistible power.

324

Each of the ads on this page is a seed planted in a large circle of vessel owners. It grows by repetition until it bears the fruit of business.

323

Do you handle Admiralty cases?

**Yes?**

Why not do a little shouting—you can handle more? You have a vast field of prospects, BUT, what are you doing to introduce yourself to them?

322

This page of Admiralty Proctor's cards is a directory for the vessel owner or operator. You can have your card in this directory at a surprisingly low cost.

321

Please mention THE MARINE REVIEW when writing to Advertisers

## McArthur Jacob's Ladder



This ladder embraces several new features which have been dictated by experience and is the ideal ladder for use aboard ship.

It is now made in sections of any desired length. The sections can be instantly connected by means of snap hooks, adapting the ladder to light or loaded conditions of ships and eliminating the telescopic feature of the former type.

The cable is of plow steel combining lightness with great strength; the steps stamped sheet metal with two-tooth prongs giving a firm foothold; hooks bronze and rivets copper.

The ladder can be compactly rolled up for storage.

"We beg to advise that the Jacob's Ladder furnished the steamer Castalia during season 1913 has proven very satisfactory indeed. The master, Capt. W. L. Girardin, reports that these ladders should be installed on all the boats as they are very efficient and much safer than the old style roper ladder."

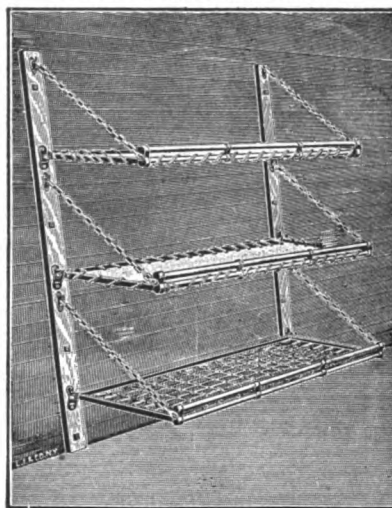
The Brown Steamship Company, Cleveland.

**McArthur Portable Fire Escape Co.**  
**CLEVELAND OHIO**

The McArthur Jacob's Ladder is patented and all infringements upon it will be prosecuted

## The Southern - Rome Company

BALTIMORE, MD.



No. 1 ROMELINK BERTH (Open)

MANUFACTURERS OF

**Metal Berths and Bunks**  
**of Every Description**

*Illustrated Catalog upon request*

**SOUTHERN-ROME COMPANY**

623-633 West Pratt St.  
BALTIMORE, MD.

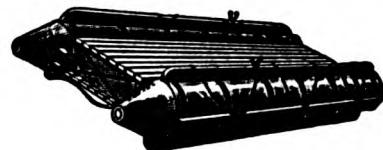


## THOS. DREIN & SON COMPANY

Established 1866  
WILMINGTON, DEL.

Sole Builders of the

Patent Beaded Bottom Metallic Life Boats, Life Rafts and  
Wooden Boats of all classes.



Outfits for Lake Steamers a Specialty



## ANDREW J. MORSE & SON, Inc.

221 High Street BOSTON, MASS.  
ESTABLISHED 1837

Diving Apparatus and Submarine Armor  
Fire Department Supplies  
The Morse Monitor Nozzle

## LIFE PRESERVERS

Cork Cushions, Fenders, Cork Ring Buoys  
"Ye Oldest Cork House in America"

ESTABLISHED 1865

**JUSTUS BRAUER & SON**  
129 Arch Street Incorporated Philadelphia, Pa.

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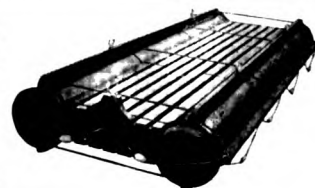


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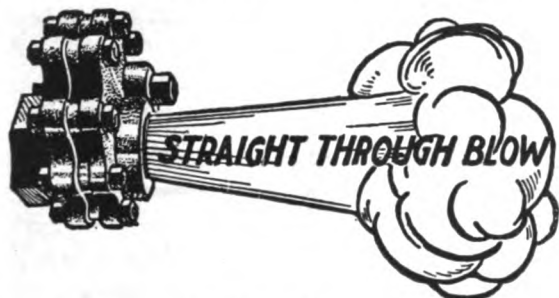
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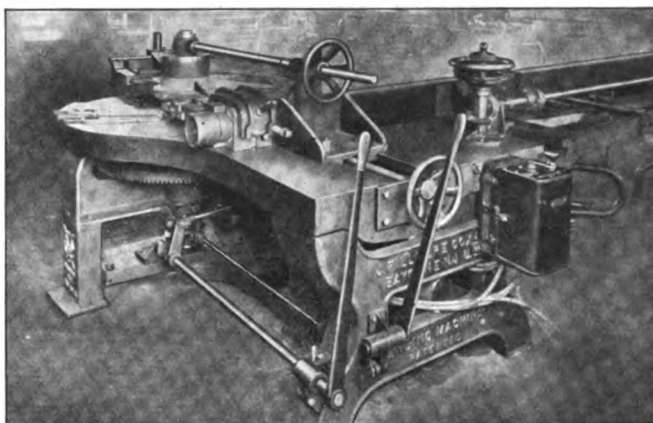
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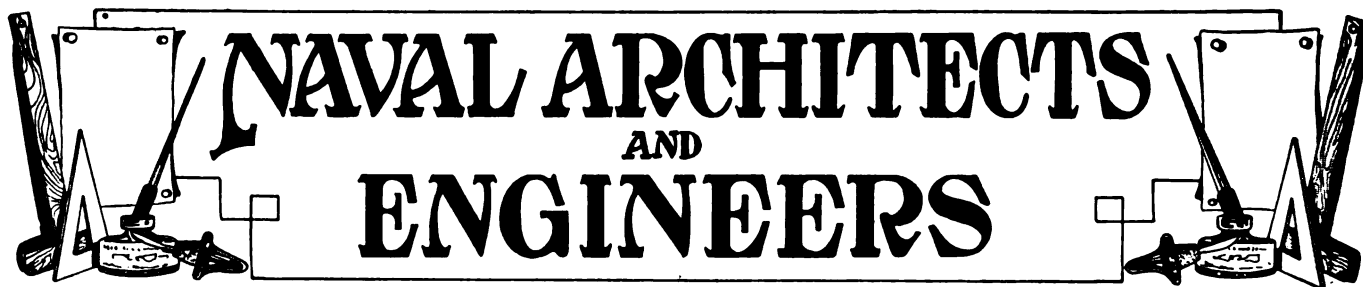


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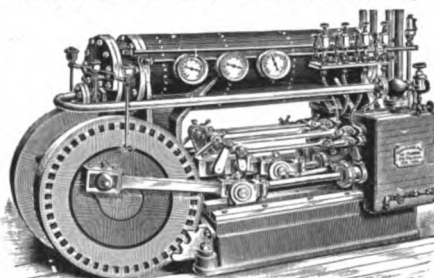
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Farley, Edward P., Co., Chicago, Ill.  
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Ried, John, & Co., New York, N. Y.

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Holding, Masten, Duncan & Leckie, Cleveland, O.  
Hoyt, Dustin, Kelley, McKeehan & Andrews, Cleveland, O.

Kremer, C. E., Chicago, Ill.  
Lillie, Lillie & Lillie, Grand Haven, Mich.  
Spencer & Spencer, Duluth, Mich.  
Warren, Cady & Ladd, & Hill, Detroit, Mich.

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Southern-Rome Co., Baltimore, Md.

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American Ship Building Co., Cleveland, O.

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Kahnweiler's, David, Sons, New York City.

Rocky River Dry Dock Co., Rocky River, O.

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(Welded.)  
Continental Iron Wks., The, Brooklyn, N. Y.

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Lake Erie Boiler Works, Buffalo, N. Y.

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Bath Iron Works, Bath, Me.

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Toledo Ship Building Co., Toledo, O.

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**Create and Maintain  
Perfect Circulation**

## **FIRE TUBE MARINE SUPERHEATER**

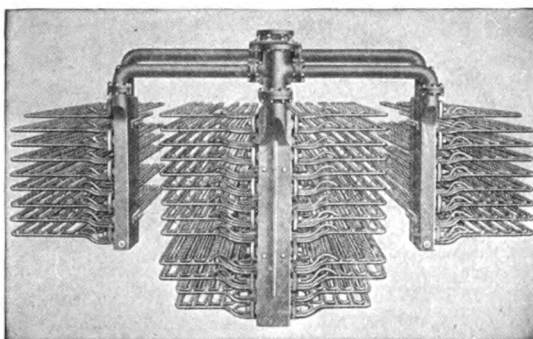
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McNab Co., Bridgeport, Conn.  
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Griscom-Russell, The, Co., New York City.  
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Manitowoc Ship Bldg. & Dry Dock Co., Manitowoc, Wis.  
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**FIRE ALARM SYSTEMS.**  
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**FIRE DEPARTMENT SUPPLIES.**  
Morse, A. J., & Son, Boston, Mass.  
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**FIXTURES.**  
General Electric Co., Schenectady, N. Y.  
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(Forged Steel Boiler.)  
Scully Steel & Iron Co., Chicago, Ill.  
**FLOOR PLATES.**  
(Wrought Steel Diamond & Ribbed Pattern.)  
Scully Steel & Iron Co., Chicago, Ill.  
**FLOORING.**  
(Composition.)  
Byerley & Sons, Cleveland, O.  
**FLOORING.**  
(Warehouse.)  
Byerley & Sons, Cleveland, O.  
**FLUE CLEANERS.**  
(Soot and Scale.)  
Scully Steel & Iron Co., Chicago, Ill.  
**FORGINGS.**  
Collingwood Ship Bldg. Co., Collingwood, Ont., Can.  
**FORGINGS.**  
(Steel.)  
Fore River Ship Bldg. Corp., Quincy, Mass.  
**FOUNDERS.**  
Chase Machine Co., Cleveland, O.  
Kingsford Fdy. & Mach. Co., Oswego, N. Y.  
Seattle Const. & Dry Dock Co., Seattle, Wash.  
**FREIGHT HOUSE FLOORS.**  
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Hall, Geo., Coal Co., Ogdensburg, N. Y.  
Hanna, M. A., & Co., Cleveland, O.  
Lorain Coal & Dock Co., Columbus, O.  
Pickands, Mather & Co., Cleveland, O.  
**FURNACES.**  
(Boilers.)  
Continental Iron Works, The, Borough of Brooklyn, N. Y.  
**FURNACE FRONTS AND DOORS.**  
(Land and Marine.)  
Continental Iron Works, The, Borough of Brooklyn, N. Y.  
**GAGES.**  
(Steam.)  
Ashton Valve Co., Boston, Mass.  
Williams, Wm. E., New York, N. Y.  
**GAGES.**  
(Water.)  
Penberthy Injector Co., Detroit, Mich.  
Williams, Wm. E., New York, N. Y.  
**GEARS.**  
(Marine Reduction.)  
Hunt, Mirk & Co., San Francisco, Cal.  
Hunt, Mirk & Co., Seattle, Wash.  
Westinghouse Mch. Co., Pittsburgh, Pa.  
**GENERATORS.**  
Engberg's Electric & Mechanical Works, St. Joseph, Mich.  
General Electric Co., Schenectady, N. Y.  
International Oxygen Co., New York, N. Y.  
**GRAIN TRIMMERS.**  
Co-Operative Grain Trimmers, Fort William, Ont., Can.  
**GRAPHITE.**  
Dixon, Joseph, Crucible Co., Jersey City, N. J.  
**GRAPHITE.**  
(Boiler Lubricating, Greases.)  
Dixon, Joseph, Crucible Co., Jersey City, N. J.  
**GRATE BARS.**  
Trout, H. G., Co., Buffalo, N. Y.  
Williams, Wm. E., New York, N. Y.  
**GREASES.**  
Dixon, Joseph, Crucible Co., Jersey City, N. J.  
**GYPSEYS.**  
(Steam.)  
American Engrg. Co., Philadelphia, Pa.  
**HAMMERS.**  
(Steam.)  
Chase Machine Co., Cleveland, O.  
**HATCH FASTENERS.**  
Mulholland Hatch-Fastener Co., Cleveland, O.  
**HEATERS AND PURIFIERS.**  
(Feed Water.)  
Ross Valve Mfg. Co., Troy, N. Y.  
Williams, Wm. E., New York, N. Y.  
**HOISTS.**  
(Air.)  
American Ship Building Co., Cleveland, O.  
**HOISTS.**  
(Anchor.)  
Superior Iron Works, Superior, Wis.

**HOISTS.**  
(Cargo, Etc.)  
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Boston & Lockport Block Co., East Boston, Mass.  
Chase Machine Co., Cleveland, O.  
Dake Engine Co., Grand Haven, Mich.  
General Electric Co., Schenectady, N. Y.  
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(Chain.)  
Dake Engine Co., Grand Haven, Mich.  
Williams, Wm. E., New York, N. Y.  
**HOISTS.**  
(Electric.)  
American Engineering Co., Philadelphia, Pa.  
General Electric Co., Schenectady, N. Y.  
**HOISTS.**  
(Pneumatic.)  
Dake Engine Co., Grand Haven, Mich.  
**HOSE.**  
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Williams, Wm. E., New York, N. Y.  
**HOTELS.**  
Hotel Tuller, Detroit, Mich.  
**HYDROGEN GENERATORS.**  
International Oxygen Co., New York, N. Y.  
**ICE MACHINES.**  
Clothel Co., The, New York City, N. Y.  
Roelker, H. B., New York City, N. Y.  
**INDICATORS.**  
Cummings Ship Instrument Wks., Boston.  
Electro-Dynamic Co., Bayonne, N. J.  
McNab Co., Bridgeport, Conn.  
**INDICATORS.**  
(Direction.)  
Cummings Ship Instrument Works, Boston.  
Electro-Dynamic Co., Bayonne, N. J.  
McNab Co., Bridgeport, Conn.  
**INDICATORS.**  
(Recording.)  
McNab Co., Bridgeport, Conn.  
**INDICATORS.**  
(Speed.)  
Cummings Ship Instrument Works, Boston.  
McNab Co., Bridgeport, Conn.  
**INJECTORS.**  
Penberthy Injector Co., Detroit, Mich.  
Williams, Wm. E., New York, N. Y.  
**INSURANCE.**  
(Marine.)  
Boland & Cornelius, Buffalo, N. Y.  
Hutchinson & Co., Cleveland, O.  
Richardson, W. C., & Co., Cleveland, O.  
Vance & Joys, Milwaukee, Wis.  
**IRON ORE.**  
Hanna, M. A., & Co., Cleveland, O.  
Pickands, Mather & Co., Cleveland, O.  
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Baltimore Dry Dock & Shipbuilding Co., Baltimore, Md.  
**LADDERS.**  
(Portable.)  
McArthur Portable Fire Escape Co., Cleveland  
**LAMPS.**  
(Mazda and Arc.)  
General Electric Co., Schenectady, N. Y.  
Williams, Wm. E., New York, N. Y.  
**LANTERNS.**  
(Buoy.)  
Safety Car Heating & Lighting Co., New York  
**LAUNCHES.**  
Drein, Thomas, & Son, Wilmington, Del.  
**LIFE BOATS.**  
Detroit Ship Bldg. Co., Detroit, Mich.  
Drein, Thomas, & Son, Wilmington, Del.  
Kahnweiler's, David, Sons, New York, N. Y.  
Lane, C. M., Life Boat Co., Brooklyn, N. Y.  
Welin Marine Equipment Co., Long Island City, N. Y.  
Williams, Wm. E., New York, N. Y.  
**LIFE RAFTS.**  
Detroit Ship Building Co., Detroit, Mich.  
Drein, Thos., & Son, Wilmington, Del.  
Lane, C. M., Life Boat Co., Brooklyn, N. Y.  
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Lane, C. M., Life Boat Co., Brooklyn, N. Y.  
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Lane, C. M., Life Boat Co., Brooklyn, N. Y.  
Welin Marine Equipment Co., Long Island City, N. Y.  
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Brauer, Justus, & Son, Inc., Philadelphia, Pa.  
Kahnweiler's, David, Sons, New York City.  
Lane, C. M., Life Boat Co., Brooklyn, N. Y.  
**LIFE PRESERVERS.**  
(Ilanasilk.)  
Robinson-Rodgers Co., The, Newark, N. J.  
**LIFE SAVING EQUIPMENT.**  
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Drein, Thos., & Son, Wilmington, Del.  
Kahnweiler's, David, Sons, New York City.  
Lane, C. M., Life Boat Co., Brooklyn, N. Y.  
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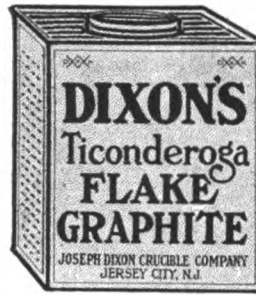
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General Electric Co., Schenectady, N. Y.
- LOCOMOTIVE SUPERHEATERS.**  
Locomotive Superheater Co., New York, N. Y.
- LOGS.**  
(Patent.)  
Cummings Ship Instrument Works, Boston.
- LOGS.**  
(Ship.)  
Nicholson Ship Log Co., Cleveland, O.  
Walker, Thomas & Son, Birmingham, Eng.
- LUBRICANTS.**  
Dixon, Joseph, Crucible Co., Jersey City, N. J.
- LUBRICATING GRAPHITE.**  
Dixon, Joseph, Crucible Co., Jersey City, N. J.
- LUBRICATORS.**  
Penberthy Injector Co., Detroit, Mich.
- MACHINERY.**  
Kingsford Fdy. & Machine Co., Oswego, N. Y.
- MACHINERY.**  
(Marine.)  
American Ship Building Co., Cleveland, O.  
Chase Machine Co., Cleveland, O.  
Chicago Ship Building Co., South Chicago, Ill.  
Collingwood Ship Building Co.,  
Collingwood, Ont., Can.  
Dake Engine Co., Grand Haven, Mich.  
Detroit Ship Building Co., Detroit, Mich.  
Fletcher, W. & A., Co., Hoboken, N. J.  
Fore River Ship Building Corp., Quincy, Mass.  
Johnston Bros., Ferrysburg, Mich.  
Manitowoc Ship Bldg. & Dry Dock Co.,  
Manitowoc, Wis.  
Superior Iron Works, Superior, Wis.  
Superior Ship Building Co., Superior, Wis.  
Toledo Ship Building Co., Toledo, O.
- MACHINISTS.**  
Chase Machine Co., Cleveland, O.  
Seattle Construction & Dry Dock Co.,  
Seattle, Wash.  
Superior Iron Works, Superior, Wis.
- MARINE RAILWAY.**  
Rocky River Dry Dock Co., Rocky River, O.
- MARINE REDUCTION GEARS.**  
Hunt, Mirk & Co., San Francisco, Cal.  
Hunt, Mirk & Co., Seattle, Wash.
- MARINE STATIONARY FURNACE WALLS.**  
Wager, Robert H., New York, N. Y.
- MARINE SUPERHEATERS.**  
Locomotive Superheater Co., New York, N. Y.
- MARLINE.**  
Waterbury Co., New York, N. Y.
- MARLINE COVERED WIRE ROPE.**  
Waterbury Co., New York, N. Y.
- MATTRESSES AND PILLOWS.**  
(Ilanasilk.)  
Robinson-Rodgers Co., The, Newark, N. J.
- MECHANICAL WORKS.**  
Engberg's Elec. & Mech. Works,  
St. Joseph, Mich.
- METAL POLISH.**  
Hoffman, Geo. Wm., Co., Indianapolis, Ind.
- METALLIC PACKING.**  
U. S. Metallic Packing, The, Co., Philadelphia
- METERS.**  
(Torsion.)  
Cummings Ship Instrument Works, Boston.
- MOORING LINES.**  
Durable Wire Rope Co., Boston, Mass.
- MOTORS.**  
(Electric.)  
Electro-Dynamic Co., Bayonne, N. J.  
General Electric Co., Schenectady, N. Y.
- MOTORS.**  
(Winch.)  
General Electric Co., Schenectady, N. Y.
- MUSIC WIRE.**  
Waterbury Co., New York, N. Y.
- NAUTICAL INSTRUMENTS.**  
Ritchie, E. S., & Sons, Brookline, Mass.
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Cleveland & Buffalo Transit Co., Cleveland, O.  
Detroit & Cleveland Nav. Co., Detroit, Mich.  
Hudson Navigation Co., New York, N. Y.
- NOZZLES.**  
Morse, A. J., & Sons, Boston, Mass.
- OAKUM.**  
Stratford, Geo., Oakum Co., Jersey City, N. J.
- OILS AND LUBRICANTS.**  
Dixon, Joseph, Crucible Co., Jersey City, N. J.
- OIL.**  
(Linseed.)  
Patterson-Sargent Co., Cleveland, O.
- OIL BURNERS.**  
(Mechanical Atomizing.)  
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- OXYGEN TESTING APPARATUS, WELDING AND CUTTING APPARATUS.**  
International Oxygen Co., New York City.
- OXYGEN GENERATORS.**  
International Oxygen Co., New York City.
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Carcy, The, Co., Cleveland, O.  
Home Rubber Co., Trenton, N. J.
- PACKING.**  
(Metallic.)  
U. S. Metallic Packing, The, Co., Philadelphia
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(Copper and Iron.)  
Patterson-Sargent Co., Cleveland, O.
- PAINT.**  
(Graphite.)  
Dixon, Joseph, Crucible Co., Jersey City, N. J.
- PAINT.**  
(Hull.)  
Patterson-Sargent Co., Cleveland, O.
- PAINT.**  
(Marine.)  
Patterson-Sargent Co., Cleveland, O.
- PATENT IMPROVED BRIDGE WALLS.**  
Wager, Robert H., New York, N. Y.
- PATENTS.**  
Siggers & Siggers, Washington, D. C.
- PIER FLOORS.**  
Byerley & Sons, Cleveland, O.
- PIG IRON.**  
Hanna, M. A., & Co., Cleveland, O.
- PIPE.**  
(Welded Steel.)  
Continental Iron Works, The,  
Borough of Brooklyn, N. Y.
- PIPE BENDING MACHINES.**  
Cox, J. Fillmore, Engrg. & Tube  
Bending Machine Works, Bayonne, N. J.
- PIPE WELDING.**  
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General Electric Co., Schenectady, N. Y.
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- Superior Ship Bldg. Co., Superior, Wis.**
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- PUMPS.**  
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Blackmer Rotary Pump Co., Petoskey, Mich.  
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Mulholland Hatch-Fastener Co., Cleveland, O.
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Commercial Boiler Wks., The, Seattle, Wash.
- REPAIRS.**  
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Baltimore Dry Docks & Ship Bldg. Co.,  
Baltimore, Md.
- Bath Iron Works, Bath, Me.**
- Buffalo Dry Dock Co., Buffalo, N. Y.**
- Chicago Ship Building Co., South Chicago, Ill.**
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- Superior Ship Building Co., Superior, Wis.**
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Dake Engine Co., Grand Haven, Mich.  
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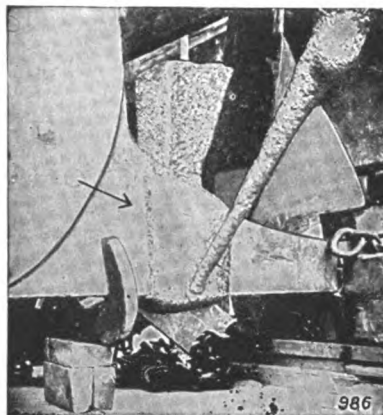
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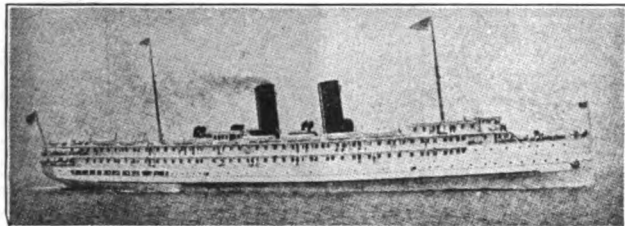
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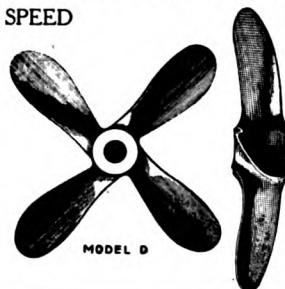
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**STOPPERS.**  
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American Engineering Co., Philadelphia, Pa.

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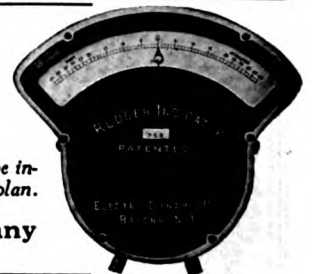
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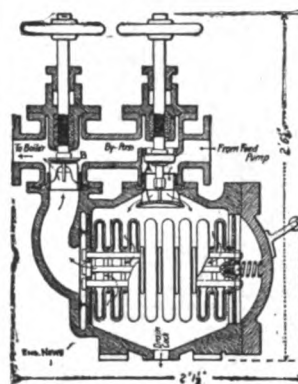
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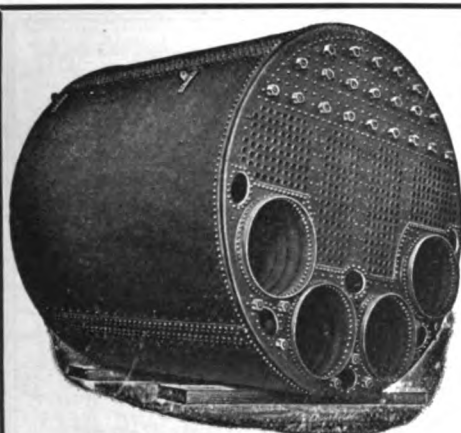
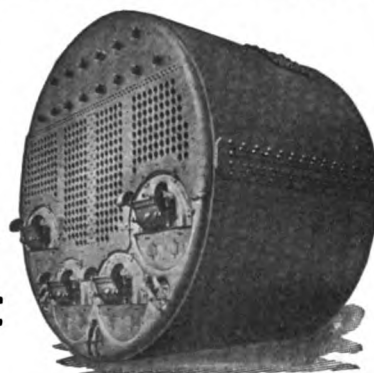
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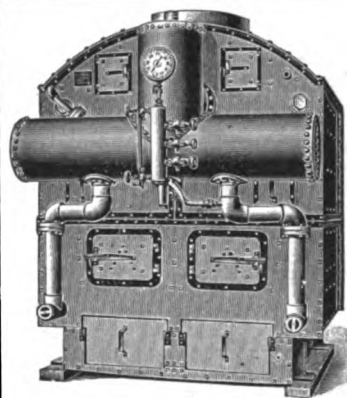
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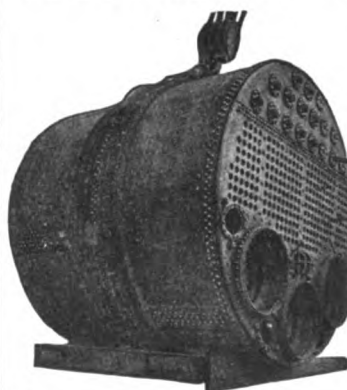
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# Index to Advertisements

A		I		R	
Almy Water Tube Boiler Co.	69	International Mercantile Marine Co.	70	Reid, John & Co.	60
American Engineering Co.	2	International Oxygen Co.	73	Richardson, W. C. & Co.	58
American Line	70	Isherwood, J. W.	8	Ritchie, E. S., & Sons	72
American Ship Building Co.	20			Robinson, Rodgers Co.	59
Armstrong Mfg. Co.	75			Rocky River Dry Dock Co.	10
Ashton Valve Co.	69			Roelker, H. B.	61
				Rosa Valve Mfg. Co.	69
B		J		S	
Babcock & Penton	60	Johnston Brothers	13	Safety Car Heating & Lighting Co.	55
Babcock & Wilcox Co.	65			Schrader's, A. Son, Inc.	59
Baltimore Dry Docks & Shipbuilding Co.	13			Schroeder Bros. Co.	68
Bath Iron Works, Ltd.	12			Scully Steel & Iron Co.	59
Blackmer Rotary Pump Co.	73			Seattle Construction & Dry Dock Co.	12
Boland & Cornelius	58			Sheriffs Mfg. Co.	73
Boston & Lockport Block Co.	73			Siggers & Siggers	68
Brauer, Justus & Son	57			Southern-Rome Co.	57
Breymann, G. H., & Bros.	67			Spencer & Spencer	56
Buffalo Dry Dock Co.	11			Standard Bridge Tool Co.	76
Byerley & Sons	17			Stratford, Geo., Oakum Co.	61
C				Sullivan, D., & Co.	58
Carey Co., The	17			Superior Iron Works Co.	75
Case, A. Wells, & Son	67			Superior Ship Building Co.	9
Chase Machine Co.	68				
Chicago Ship Building Co.	9				
C. & B. Transit Co., The	61				
Clothel Co.	7				
Collingwood Ship Bldg. Co.	69				
Commercial Boiler Works	2				
Continental Iron Works, The	58				
Co-Operative Grain Trimmers	55				
Cory, Chas., & Son, Inc.	59				
Cox, J. Fillmore, Engrg. & Tube Bending Mch. Works	76				
Cummings Ship Instrument Works	60				
Curr, Robert					
D					
Dake Engine Co.	72				
Delaney, P., & Co.	69				
De Laval Steam Turbine Co.	18				
E					
Eckliff Automatic Boiler Circulator Co.	63				
Electro-Dynamic Co.	68				
Engberg's Electric & Mechanical Works	55				
Erdman, Joseph	68				
F					
Falls Hollow Staybolt Co.	73				
Farley, Edward P., Co.	60				
Fletcher, W. & A. Co.	67				
Fore River Ship Bldg. Corp.	68				
Furstenau, M. C.	60				
G					
General Electric Co.	19				
Gilchrist, Albert J.	56				
Goldschmidt Thermit Co.	67				
Goulder, White & Garry	56				
Griscom-Russell Co.	69				
H					
Hall, Geo., Coal & Coke Co.	69				
Hanna, M. A., & Co.	74				
Hoffman, Geo. Wm., Co.	55				
Holding, Masten, Duncan & Leckie	56				
Home Rubber Co.	59				
Hotel Tuller	70				
Hoyt, Dustin, Kelley, McKeehan & Andrews	56				
Hudson Navigation Co.	61				
Hutchinson & Co.	58				
K					
Kahnweiler's, David, Sons	75				
Kingsford Fdy. & Mch. Wks.	69				
Kremer, C. E.	56				
L					
Lake Erie Boiler Works	68				
Lane, C. M., Life Boat Co.	57				
Lillie, Lillie & Lillie	56				
Locomotive Superheater Co.	63				
Lorain Coal & Dock Co.	74				
M					
McArthur Portable Fire Escape Co.	57				
McNab Company	65				
Manitowoc Shipbuilding & Dry Dock Co.	12				
Milwaukee Dry Dock Co.	11				
Moore & Scott Iron Works	13				
Morse, A. J., & Son, Inc.	57				
Mulholland Hatch-Fastener Co.	68				
N					
Naval Consulting Board of the United States	16				
Nicholson Ship Log Co.	73				
P					
Patterson-Sargent Co.	61				
Penberthy Injector Co.	76				
Pickands, Mather & Co.	74				
Pneumercator Co., Inc.	14, 15				



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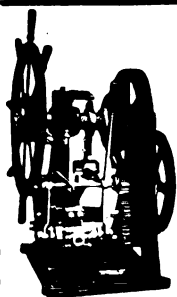
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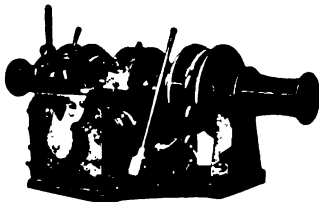
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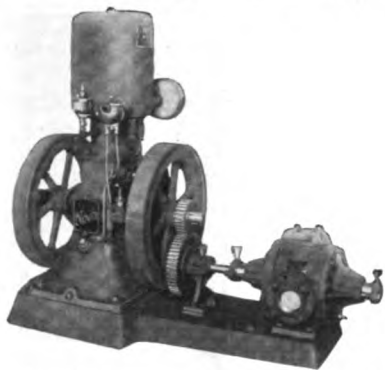
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## Can You Beat This With Your Bilge Pump?



By using Blackmer you have a pump for fighting fire and washing decks as well as bilge work.

We specialize in Bilge pumps and guarantee them to please you.

They are not an experiment as they have been in actual use for now upwards of nine years.

A letter from any of our customers will prove to you they are superior.

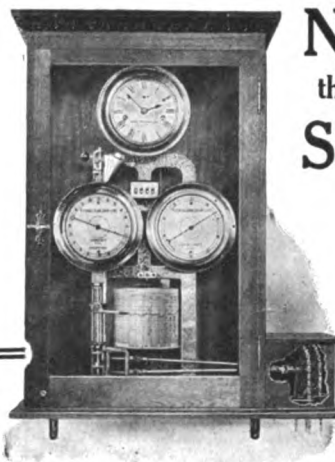
All pumps have but five working parts.

No springs.

Wear automatically taken up.

Priming not necessary.

**BLACKMER ROTARY PUMP COMPANY**  
PETOSKEY, MICH.



## NICHOLSON

the most advanced type of

## SHIP LOG

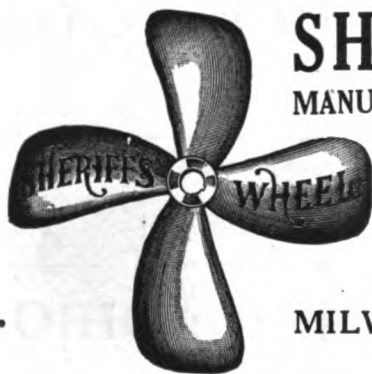
Gives the mileage sailed, and shows the exact speed per hour on a dial, recording it on a chart for every minute of the trip.

The Nicholson Recording Ship Log is installed on battle ships, passenger ships, bulk freighters, car ferries, yachts, and motor boats.

*Write for catalogue*

**NICHOLSON SHIP LOG CO.**  
Cleveland, O.

ESTABLISHED, 1854.

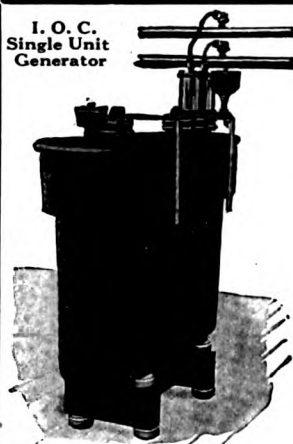


**SHERIFFS**  
MANUFACTURING CO.

Manufacturers of  
**PROPELLER WHEELS**  
Marine Engines and Repairs.

**MILWAUKEE, WIS.**  
Phone S. 163

I. O. C.  
Single Unit  
Generator



**I.O.C. SYSTEM**

**OXYGEN and HYDROGEN GENERATORS**

show such marked economies over purchased gas as to quickly repay the cost of the generator installation—leaving later savings as clear profits.

*Send for Catalog No. 3 on "I. O. C. Gas Generators"*

**INTERNATIONAL OXYGEN CO.**

General Sales Offices  
115 Broadway, NEW YORK

## Hollow Threaded Stays



Fully comply with the Federal Inspection Law, save the cost of drilling and breakage of drills. The hole is rolled absolutely in the center. They inspect automatically at both ends, and the air admitted into the firebox through Hollow Stays greatly improves combustion.

**QUALITY AND WORKMANSHIP GUARANTEED**

*Write us for prices*

**FALLS HOLLOW STAYBOLT COMPANY**  
CUYAHOGA FALLS, OHIO

## Boston & Lockport Block Co.

124 Condor Street, East Boston, Mass.  
New York City 33 South St. Chicago 413 Fort Dearborn Bldg San Francisco 110 Market St.

★ **STAR BRAND** ★  
**BLOCKS—PUMPS**

**FERRALL'S HUB HOISTER**

The best rope saving coal or cargo hoisting block manufactured. Made for either manila or wire rope. Sheaves are fitted with star metaline bushings and side bearings, which keep the sheaves from heating.



**LOUDS**  
Diaphragm Pumps

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# Coal

For shipment via Great Lakes in CARGO LOTS or for Fueling Vessels. Write or 'phone us for prices on best grades of Domestic, Coking, Gas and Steam coals for prompt delivery.

## M.A. HANNA & Co.

Sales Agents, Cleveland



## The Lorain Coal & Dock Co.

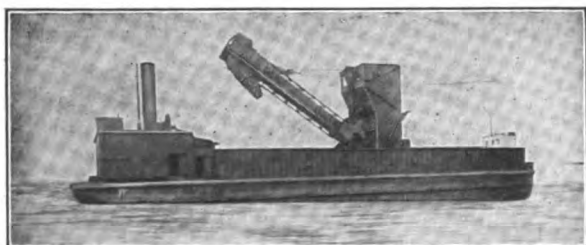
General Offices: COLUMBUS, OHIO

**Producers and Shippers of ECLIPSE HOCKING  
AND CRESCENT PITTSBURGH COAL**

Docks and Fuel Lighter

LORAIN, OHIO.

## PICKANDS, MATHER & CO.



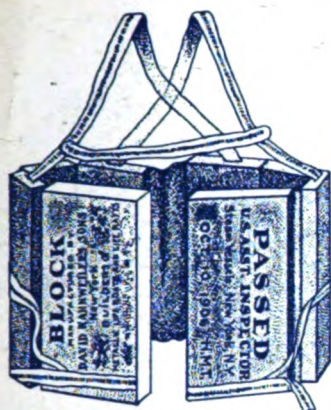
Lighter "West Shore." Buffalo, N. Y.  
Capacity 500 Tons per hour

FUEL LIGHTERS at Buffalo, Erie, Ashtabula, Cleveland. At Detour, Mich., a Fuel Dock equipped with chute capacity of 600 tons. Best quality Pittsburgh coal furnished at any time during day or night.

**Western Reserve Building  
CLEVELAND, O.**

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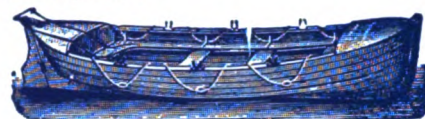


## Solid Block Cork Life Preservers

Warranted 24 pounds. Buoyancy and full weight of Cork and Workmanship as required by U. S. Inspectors.

**SAFEST CHEAPEST**  
SOLID CORK LIFE PRESERVERS  
RING BUOYS AND FENDERS

Approved and adopted by U. S. Board of Supervising Inspectors. Also adopted by the principal Ocean, Lake and River Steamer Lines as the only Reliable Life Preserver. Awarded four Medals by World's Columbian Exposition.



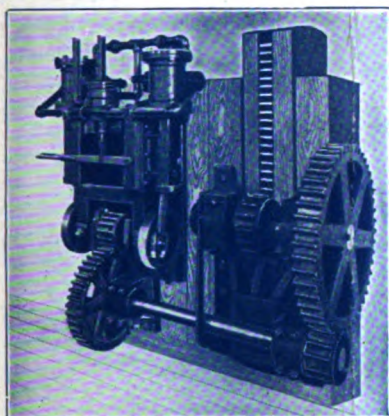
METALLIC AND WOODEN LIFE BOATS  
METALLIC LIFE RAFT  
MARINE DRAGS LYLE GUNS

WICKS' PATENT RELEASING BLOCKS FOR LIFE BOATS

## DAVID KAHNWEILER'S SONS

260 FRONT ST., COR. DOVER ST.

NEW YORK CITY



## Anchor Hoist Engines and Lock Plates for Operating Dredge and Drill Boat Anchors

Double 6" x 6", 7" x 9" and 9" x 10" Throttle Reverse Engines

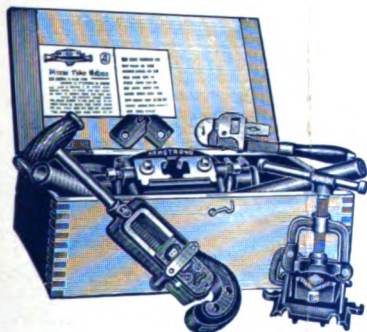
With Gearing to suit the size of Anchors

The Hoist is compact and efficient, and occupies no deck room. Any arrangement can be made to suit local conditions.

We build the engines with either throttle or link reverse, as well as non-reversible and for a great many purposes.

—BUILT BY—

**Superior Iron Works Company, SUPERIOR, WIS.**



## ARMSTRONG COMBINATION KITS

CONSISTING OF

- |                                 |                                |
|---------------------------------|--------------------------------|
| 1 No. 2 Genuine Armstrong Stock | $\frac{1}{4}$ in. to 1 in. R   |
| 1 " 1 Model B Pipe Cutter       | $\frac{1}{8}$ " $1\frac{1}{4}$ |
| 1 Junior Hinged Pipe Vise       | $\frac{1}{8}$ " $1\frac{1}{4}$ |
| 1 10 in. Stillson Wrench        | $\frac{1}{8}$ " 1              |

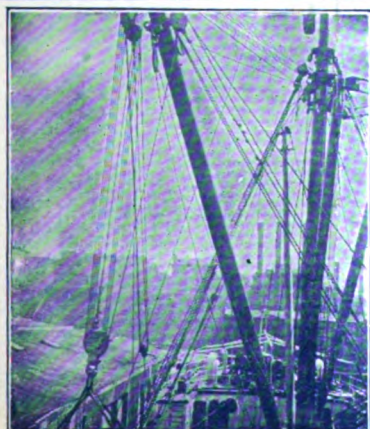
STOCKS ARE FITTED WITH BARD ADJUSTABLE BUSHING  
IN A HARD WOOD CASE

ENGINEERS AND FITTERS APPRECIATE THIS KIT.

Manufactured by

**THE ARMSTRONG MFG. CO.**

296 Knowlton St., BRIDGEPORT, CONN.  
NEW YORK, 248 Canal St.



## Durable Wire Rope Co.

93-95 Pearl St., Boston, Mass.

Durable Wire Rope will Not Rust or Rot and is not affected by Salt Water or Climatic Conditions

FOR

Mooring Lines  
Ship Rigging  
Hoisting

Towing Hawsers  
Dredging  
Coal Pockets

Stevedoring  
Boat Falls  
Pile Driving

Tiller Ropes  
Yacht Rigging  
Fasts

BRANCH OFFICES

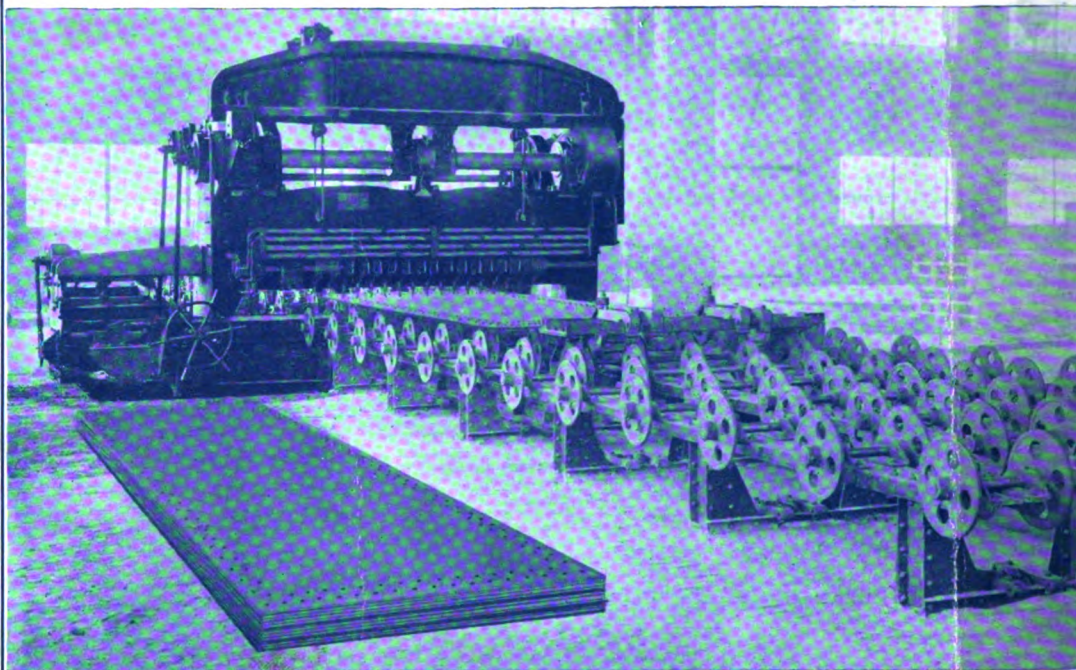
165 W. Lake St., Chicago, Ill.

701 St. Clair Ave. N. E., Cleveland, O.

NEW YORK AGENTS: HEGEMAN & WARD, 43 SOUTH STREET

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**All  
Shapes**

**Rectangular  
Curved  
Skewed  
Offset**

## THOMAS AUTOMATIC SPACING TABLE

FOR PUNCHING ALL KINDS OF PLATES

Ship—Steel Barges—Tanks—Boilers, Etc.

STANDARD BRIDGE TOOL CO.,

Pittsburg, Pa.

## Know your speed and position

*absolutely accurate without calculations*

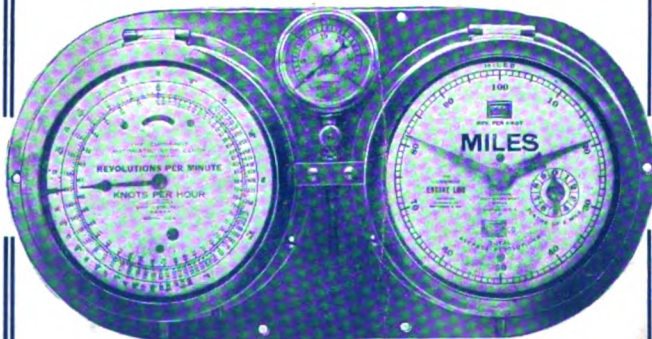
by referring to

### The Cummings Engine Log System

A good captain always fears a fog, for he well knows that where there is a fog there is danger.

Consequently, when he strikes a fog, it is of vital importance for him to know the *exact* distance and speed that he travels into it.

The captain who depends upon approximate calculations often sends his ship to the bottom.



A Cummings Engine Log and Speed Clock should always be visible to every captain in the pilot house. It registers the exact distance traveled, average R. P. M. of engines and speed of ship and reduces probability of accident or loss of time.

Ask us for full details

**Cummings Ship Instrument Works**  
110 High Street, Boston, U. S. A.



## AUTOMATIC INJECTOR

No other  
INJECTOR  
on the  
market  
so simple,  
reliable  
or durable.



800,000  
Engineers  
testify  
as to its  
merits.  
**WORLD'S  
STANDARD.**

The Penberthy Automatic is absolutely so, it is re-starting, self-draining. It is the ideal Injector for Marine use.

### "XL--96" EJECTOR



On account of the great elevating and lifting power of the "XL-96" when using a minimum amount of steam, it is at its best when replacing the bilge pump.

Our No. 27 Catalog tells of these.  
Write for it—Now.

**Penberthy Injector Co.**

DETROIT, MICH.

Canadian Factory—Windsor, Ont.

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# THE MARINE REVIEW

VOL. 46

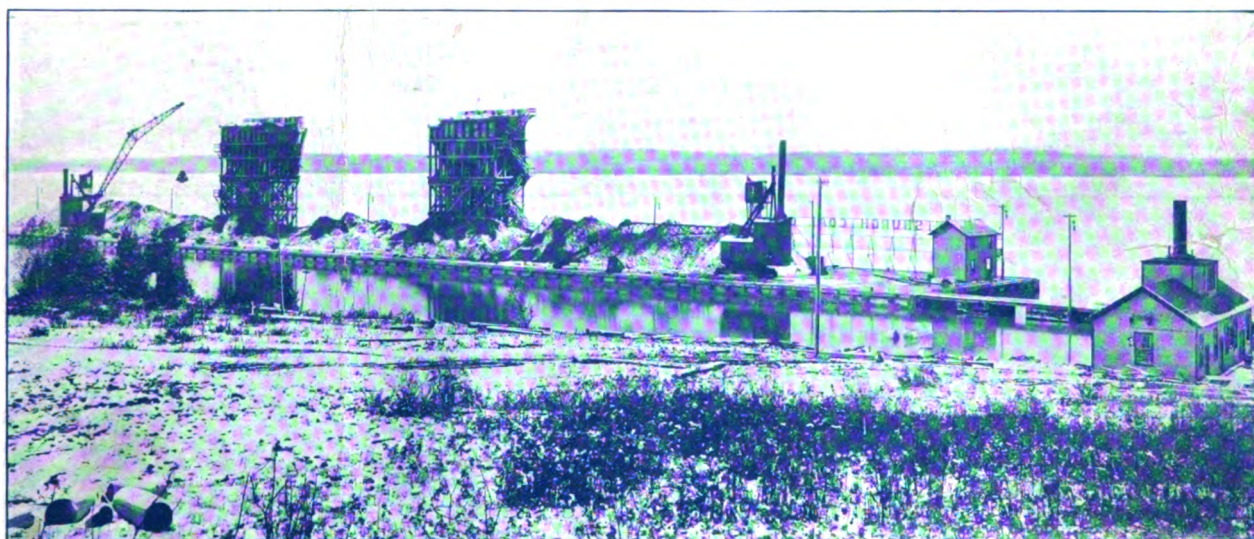
CLEVELAND

AUGUST, 1916

NEW YORK

No. 8

## PITTSBURGH COAL COMPANY LIME ISLAND FUEL DOCK



### OUR NEW LIME ISLAND FUEL DOCK

Soo River, is in full operation. Fuel Pockets Capacity 800 Tons. Fastest Fuel Handling Plant on the Great Lakes. Steamers can reach dock without rounding to, load fuel and be on their way within five minutes. We handle nothing but our CELEBRATED PITTSBURGH COAL on this dock.

General Office  
**PITTSBURGH, PA.**

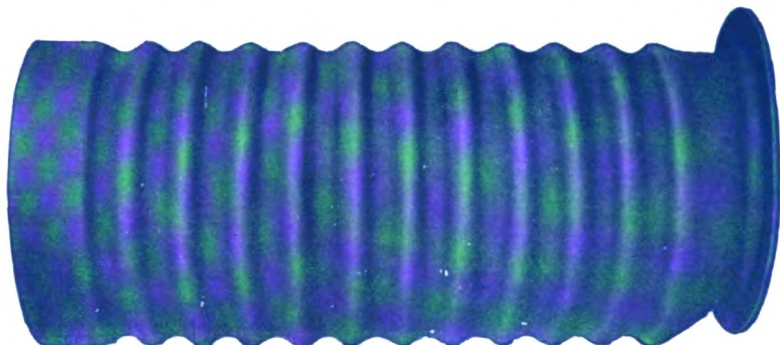
Cleveland, Ohio  
Rockefeller Building

Chicago, Ill.  
Old Colony Building

Sault Ste. Marie, Mich.  
Port Royal Dock Co.



# Morison Suspension Boiler Furnaces



For Land  
and  
Marine Boilers

Uniform Thickness

Easily Cleaned

Unexcelled for Strength

Also FOX CORRUGATED FURNACES

Manufactured by

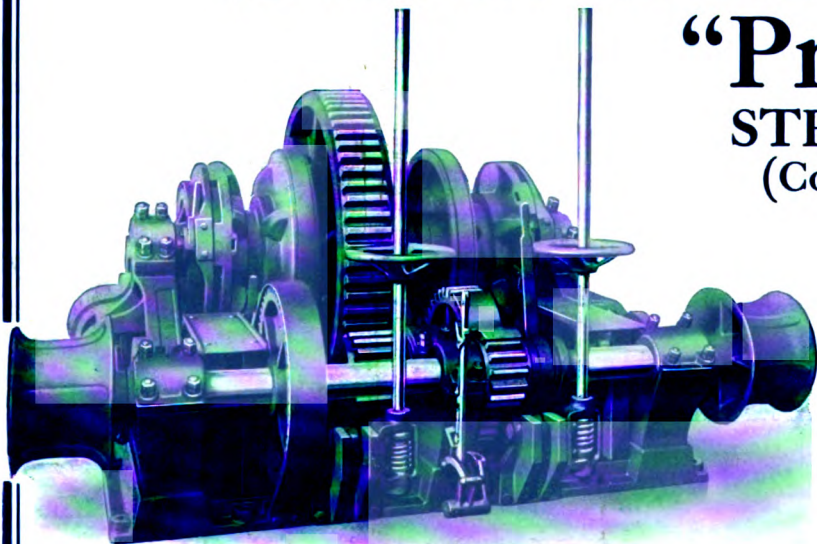
**THE CONTINENTAL IRON WORKS**

West and Calyer Sts., BOROUGH OF BROOKLYN, N. Y.

Greenpoint Ferry from East 23rd Street, New York

"Having a PULL means having a friend in power  
who will act as a steam windlass for you." The

**"Providence"**  
STEAM WINDLASS  
(Compound Spur Gears)



has another kind of *pull*, and plenty of it. It has 15 per cent more *pull* than the worm geared types and at 50 per cent faster speed. You have been looking for just this combination. Our price will please you, too.

*Write us today.*

**AMERICAN ENGINEERING COMPANY**

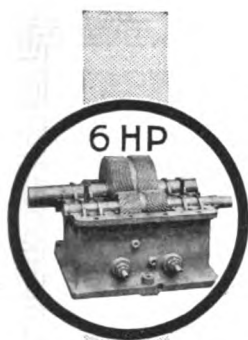
SUCCESSORS TO AMERICAN SHIP WINDLASS CO. AND WILLIAMSON BROS. CO.

MACHINISTS AND FOUNDERS

PHILADELPHIA

15-312

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# Westinghouse Marine Gears

In the same manner that our larger Marine Gears have provided means for securing speeds of turbine and propeller conducive to the highest efficiency of both; so have our smaller gears enabled us to secure the highest economical and mechanical efficiencies in turbine-driven lighting sets, turbine-driven condenser pumps, and other auxiliary apparatus where previously a speed compromise was necessary.

## Marine Equipment

Marine Turbines and Reduction Gears, LeBlanc Air Ejectors, Condensers and Auxiliaries, LeBlanc Ice and Refrigerating Systems and Turbine-Driven Lighting Sets.

 A large, detailed image of a Westinghouse marine gear unit, showing the large gear wheel and the housing. The gear wheel is a large, circular metal disc with many teeth. The housing is a complex metal structure that surrounds the gear wheel. The text "11,000 HP" is printed in a white oval on the gear wheel.
 

11,000 HP

**The Westinghouse  
Machine Co.**

East Pittsburgh, Pa. -  
Washington, D.C.

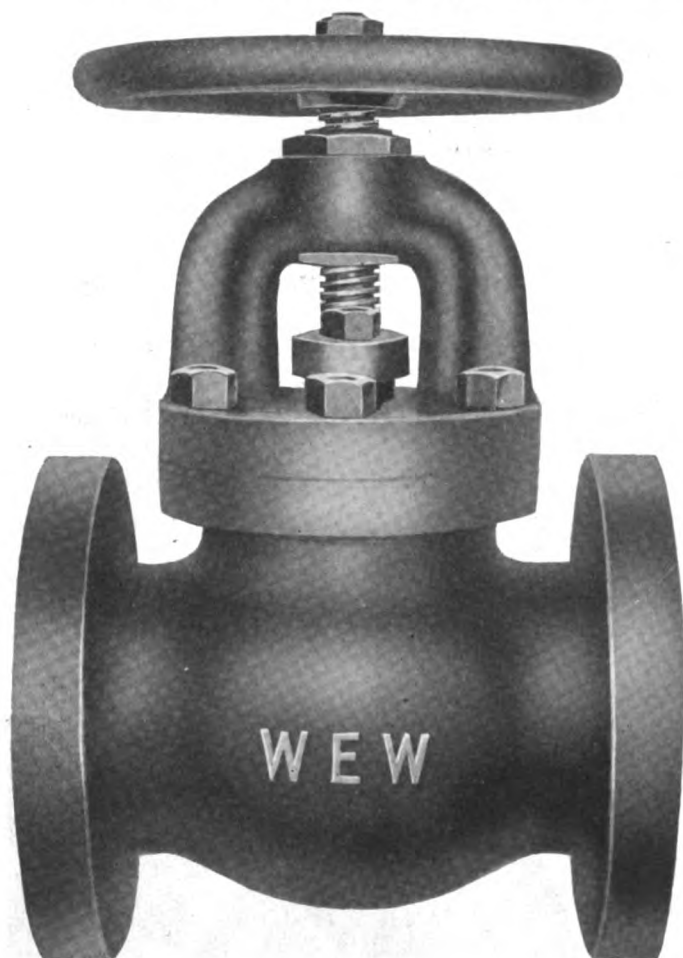
**Hunt-Mirk & Co.**  
San Francisco. Seattle.

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# "WEW" VALVES

are especially made for Marine Service, and  
are thoroughly guaranteed in every respect



Cross Valves  
Snifting Valves  
Relief Valves  
Throttle Valves  
Gate Valves  
Check Valves  
Oil Cups  
Grease Cups  
Lubricators  
Try Cocks  
Water Gauges  
Steam Gauges  
and Steam Cocks

We carry a full line of Bronze and Iron Body Valves in stock. Send at once for our catalog which shows the most important and most used types of valves. If the valve you require is not shown, remember we make it.

The "WEW" is the heaviest and best valve made

*Write us*

## WILLIAM E. WILLIAMS

62 Front St., NEW YORK

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